ZOONOSES MONITORING

SPAIN

The Report referred to in Article 9 of Directive 2003/ 99/ EC

TRENDS AND SOURCES OF ZOONOSES AND ZOONOTIC AGENTS IN HUMANS, FOODSTUFFS, ANIMALS AND FEEDINGSTUFFS

including information on foodborne outbreaks, antimicrobial resistance in zoonotic agents and some pathogenic microbiological agents

IN 2007

INFORMATION ON THE REPORTING AND MONITORING SYSTEM

Country: **Spain**
Reporting Year: **2007**
Institutions and laboratories involved in reporting and monitoring:

Laboratory name	Description	Contribution
Subdireccion General de Sanidad Animal	Ministerio de Medio Ambiente y Medio Rural y Marino	Reporting Officer
Subdireccion General de Coordinacion de Alertas y Programacion de Control Oficial	Agencia Española de Seguridad Alimentaria y Nutricion	National Reporter
Centro Nacional de Epidemiologia	Instituto de Salud Carlos III Ministerio de Sanidad y Consumo	National Reporter
Subdireccion General de Ordenacion y Buenas Practicas Ganaderas	Ministerio de Medio Ambiente y Medio Rural y Marino	National Reporter
Subdireccion General de Alimentacion Animal y Zootecnia	Ministerio de Medio Ambiente y Medio Rural y Marino	National Reporter
Departamento de Sanidad Animal	Facultad de Veterinaria de la Universidad Complutense de Madrid	National Reporter
Servicios de Sanidad Animal	Consejerias de Agricultura y Ganaderia de las Comunidades Autonomas	National Reporter

PREFACE

This report is submitted to the European Commission in accordance with Article 9 of Council Directive 2003/ 99/ EC[1]. The information has also been forwarded to the European Food Safety Authority (EFSA).
The report contains information on trends and sources of zoonoses and zoonotic agents in Spain during the year 2007. The information covers the occurrence of these diseases and agents in humans, animals, foodstuffs and in some cases also in feedingstuffs. In addition the report includes data on antimicrobial resistance in some zoonotic agents and commensal bacteria as well as information on epidemiological investigations of foodborne outbreaks. Complementary data on susceptible animal populations in the country is also given.
The information given covers both zoonoses that are important for the public health in the whole European Community as well as zoonoses, which are relevant on the basis of the national epidemiological situation.
The report describes the monitoring systems in place and the prevention and control strategies applied in the country. For some zoonoses this monitoring is based on legal requirements laid down by the Community Legislation, while for the other zoonoses national approaches are applied.
The report presents the results of the examinations carried out in the reporting year. A national evaluation of the epidemiological situation, with special reference to trends and sources of zoonotic infections, is given. Whenever possible, the relevance of findings in foodstuffs and animals to zoonoses cases in humans is evaluated.
The information covered by this report is used in the annual Community Summary Report on zoonoses that is published each year by EFSA.

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[1] Directive 2003/ 99/ EC of the European Parliament and of the Council of 12 December 2003 on the monitoring of zoonoses and zoonotic agents, amending Decision 90/ 424/ EEC and repealing Council Directive 92/ 117/ EEC, OJ L 325, 17.11.2003, p. 31

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1. ANIMAL POPULATIONS

The relevance of the findings on zoonoses and zoonotic agents has to be related to the size and nature of the animal population in the country.

A. Information on susceptible animal population

Sources of information:

REGA (National Register for Livestock Holdings) was the source for the total number of holdings and animals in all species. The figures in this report were taken at December/ 31/ 2007.
Data of slaughtered animals were also collected from the 2005-2006 Livestock Statistics Report of M.A.PA. and Eurostat. Data on slaughtered animals in Gallus gallus come from Autonomous Communities.

Dates the figures relate to and the content of the figures:

Number of holdings and animals: 31/ 12/ 2007
Slaughtered animals:
--Total number of slaughtered animals at December/ 31/ 2005-2006

Definitions used for different types of animals, herds, flocks and holdings as well as the types covered by the information:

'holding' in REGA means 'Whatever place where farming animals are'. They are clasified in breeding and production holdings and special holdings (such as markets, slaugtherhouses, quarantine centers, ...)
The specific definitions adopted by REGA for diferent types of holdings are those fixed in EU or Spanish Regulations.

Table Susceptible animal populations

* Only if different than current reporting year

Animal species	Category of animals	Number of herds or flocks	Year*	Number of slaughtered animals	Year*	Livestock numbers (live animals)	Year*	Number of holdings	Year*
Cattle (bovine animals)	dairy cows and heifers	29262	2007						
	mixed herds	22035	2007						
	meat production animals	124732	2007						
	in total			2576000	2006	6159930	2007		
Deer	farmed - in total	232	2007						
Gallus gallus (fowl)	parent breeding flocks for egg production line	81	2007						
	grandparent breeding flocks for egg production line	17	2007						
	grandparent breeding flocks for meat production line	29	2007						
	parent breeding flocks for meat production line	321	2007						
	breeding flocks for meat production line - in total	302	2007						
	laying hens	1711	2007			36971035	2007		
	broilers	5642	2007			127716294	2007		
	breeding flocks for egg production line - in total	360	2007						
	in total			597652346	2006				
Geese	meat production flocks	63	2007						
	breeding flocks, unspecified - in total	38	2007						
Goats	milk goats	9184	2007						
	meat production animals	48766	2007						
	mixed herds	10037	2007						
	in total			1884000	2005	2822747	2007		
Pigs	breeding animals	763	2007						
	fattening pigs	47782	2007						
	mixed herds	25787	2007						
	breeding animals - unspecified - sows and gilts	20042	2007						
	in total			38733000	2006	26674804	2007		
Rabbits	farmed	5089	2007	42491370	2003	5623951	2007		
Sheep	milk ewes	9820	2007						
	mixed herds	14515	2007						
	meat production animals	91523	2007						
	in total			19391000	2005	22720542	2007		
Solipeds, domestic	horses - in total	119002	2007	27700	2006	394447	2007		
Turkeys	meat production flocks	572	2007						

	breeding flocks, unspecified - in total	71	2007						
Wild boars	farmed - in total	141	2007						

2. INFORMATION ON SPECIFIC ZOONOSES AND ZOONOTIC AGENTS

Zoonoses are diseases or infections, which are naturally transmissible directly or indirectly between animals and humans. Foodstuffs serve often as vehicles of zoonotic infections. Zoonotic agents cover viruses, bacteria, fungi, parasites or other biological entities that are likely to cause zoonoses.

2.1. SALMONELLOSIS

2.1.1. General evaluation of the national situation

A. General evaluation

History of the disease and/ or infection in the country

Salmonellosis is the second main zoonoses (in number of human cases) in European Union, also in Spain. Salmonella is the agent more frequently implied in foodborne outbreaks in Spain.
In poultry, after the introducion in the 60's of the american production method, the especific pathology of avian salmonellosis was caused by S. pullorum and S. gallinarum. In the middle of the 80's come up a new infection in breeding flocks for meat production caused by S. enteritidis, and following it, also in laying hens and in feed S. enteritidis was isolated.

National evaluation of the recent situation, the trends and sources of infection

Nowadays the sources of infection are widespread along the food chain: feed, animals, food(eggs and ovoproducts, meat)and humans can be a source of infection.
At animal level, data in breeding flocks 2007 shown a decreased prevalence of the main zoonotic salmonella(enteritidis and typhimurium) of 1,67%(9,20% in 2006) in all production lines (but 0% in egg production line). The prevalence of top 5 was 2,15%(14% in 2006).
In layin hens, flock prevalence decreased from 36,52% (Salmonella spp.) and 15,59% (S. Enteritidis+ S. Typhimurium) in 2006 to 27,11% and 11,80% respectively in 2007. In broiler flocks, the flock prevalence decreased from 41,20% (Salmonella spp.) and 28,20% (S. Enteritidis+ S. Typhimurium) in the baseline survey 2005/ 2006 to 25,28% and 13,99% respectively in 2007.
Data indicate that prevalence is deceasing in poultry in Spain, with the implementation of control programmes.
At human level salmonellosis is a notifiable disease according to Royal Decree 2210/ 1995, laying down Epidemiological Surveillance National Network
According to Royal Decree 328/ 2003, laying down the Poultry Health Plan, all veterinarians have to notify to the Competent Authority cases of zoonoses and zoonotic agents.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

It is very difficult to establish the relevance of the data in the different steps of the food chain as sources of infection, because epidemiology of salmonellosis is very complex.
Nevertheless, human cases are mainly linked to eggs and egg derived food consumption.

Recent actions taken to control the zoonoses

Ministery of Environment and Rural and Marine Affairs and Ministry of Health and Consumer Affairs of Spain are carrying out a Control Programme of Salmonella in poultry, eggs and ovoproducts along the overall food chain, starting with monitoring systems at holdings(National Surveillance Programme).
A baseline study on the prevalence of Salmonella in turkeys and fattening pigs at slaughterhouses has been published in 2007.

Additional information

Spanish legislation on Salmonella in foodstuff:
Royal Decree 1254/ 1991 of August 2, laying down rules to preparation and conservation of mayonnaise prepared in the own stablishment and for immediat consumption foods with eggs as ingredient.
Royal Decree 3454/ 2000 of december 29, laying down hygiene rules to elaboration, distribution and commercialisation of ready-to-eat food
Royal Decree 202/ 2000 laying down rules for food handlers.
Royal Decree 640/ 2006, of May 26, 2006, laying down specific implementation conditions of the Communities rules concernig hygiene subjets, as well as foodstuff's production and commercialisation.

2.1.2. Salmonella in foodstuffs

A. Salmonella spp. in eggs and egg products

Monitoring system

Sampling strategy

The activities are made pursuant to Regulation (EC) no 178/ 2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

Eggs at egg packing centres (foodstuff based approach)

Sampling distributed evenly throughout the year

Eggs at retail

Sampling distributed evenly throughout the year

Raw material for egg products (at production plant)

Sampling distributed evenly throughout the year

Egg products (at production plant and at retail)

Sampling distributed evenly throughout the year

Diagnostic/ analytical methods used

Eggs at egg packing centres (foodstuff based approach)

Bacteriological method: ISO 6579:2002

Eggs at retail

Bacteriological method: ISO 6579:2002

Raw material for egg products (at production plant)

Bacteriological method: ISO 6579:2002

Egg products (at production plant and at retail)

Bacteriological method: ISO 6579:2002

Control program/ mechanisms

Recent actions taken to control the zoonoses

In 2003 a workshop was organised for "Salmonella in eggs and egg products" coordinated by the Spanish Food Safety and Nutrition Agency. The result was the approval between all the competent authorities in this area of the "Programme on Salmonella spp in eggs and egg products". In 2006 we have evaluated the actions taken and we study new proposals for improvement.
In this field the spanish order PRE 1377/ 2005 establishes surveillance and control messures for salmonella in holdings of laying hens for the purposes of a National Programme.

B. Salmonella spp. in broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made pursuant to Regulation (EC) no 178/ 2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Diagnostic/ analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

C. Salmonella spp. in pig meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made pursuant to Regulation (EC) no 178/ 2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Diagnostic/ analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

D. Salmonella spp. in bovine meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made pursuant to Regulation (EC) no 178/ 2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Methods of sampling (description of sampling techniques)

At slaughterhouse and cutting plant

Metodo

Diagnostic/ analytical methods used

At slaughterhouse and cutting plant

Bacteriological method: ISO 6579:2002

At meat processing plant

Bacteriological method: ISO 6579:2002

At retail

Bacteriological method: ISO 6579:2002

Table Salmonella in poultry meat and products thereof

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Hadar	S. Thompson
Meat from broilers (Gallus gallus)										
fresh										
- at slaughterhouse	F	single	25g	184	41		5	36		
- at retail	F	single	25g	206	21		1	19		1
- at cutting plant	F	single	25g	144	4	2		1	1	
meat products										
- at processing plant	F	single	25g	36	2			2		
- at retail	F	single	25g	90	1			1		

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Salmonella in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Milk, cows'								
raw	F	single	25g	182	1	1		
pasteurised milk	F	single	25g	5	0			
Dairy products (excluding cheeses)								
ice-cream	F	single	25g	563	0			
dairy products, not specified								
ready-to-eat	F	single	25g	1041	3			3
Cheeses, made from unspecified milk or other animal milk								
unspecified	F	single	25g	102	1			1

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Salmonella in red meat and products thereof (Part A)

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Bovismorbificans	S. Panama	S. Agona	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Anatum	S. Rissen	S. Mbandaka	S. Anderlecht	S. Brandenburg	S. Goldcoast	S. Hadar	S. Derby	S. Wien
Meat from pig																				
fresh																				
- at slaughterhouse	F	single	25g	315	15		1		0	8	2								2	2
- at retail	F	single	25g	66	4				2		2									
- at cutting plant	F	single	25g	63	5						2					2			1	
meat products																				
- at processing plant	F	single	25g	909	17	2			5	3	5		1							
- at retail	F	single	25g	404	5					1	4									
Meat from bovine animals																				
fresh																				
- at slaughterhouse	F	single	25g	60	4						1			2			1			
- at retail	F	single	25g	90	2									2						
- at cutting plant	F	single	25g	155	3							2				1				
meat products																				
- at processing plant	F	single	25g	46	0															

- at retail	F	single	25g	59	0															
Meat from other animal species or not specified																				
fresh																				
- at slaughterhouse	F	single	25g	147	5					2	2						1			
- at retail	F	single	25g	32	0															
- at cutting plant	F	single	25g	19	0															
meat products																				
- at processing plant	F	single	25g	18	0															
- at retail	F	single	25g	67	2						2									
Meat, mixed meat																				
minced meat	F	single	25g	2122	130			1	11	15	76	5	7	5	1			1	6	

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Salmonella in red meat and products thereof (Part B)

	S. Blockley	S. Bredeney	S. Veneziana
Meat from pig			
fresh			
- at slaughterhouse			
- at retail			
- at cutting plant			
meat products			
- at processing plant			1
- at retail			
Meat from bovine animals			
fresh			
- at slaughterhouse			
- at retail			
- at cutting plant			
meat products			
- at processing plant			
- at retail			
Meat from other animal species or not specified			
fresh			
- at slaughterhouse			
- at retail			
- at cutting plant			

meat products			
- at processing plant			
- at retail			
Meat, mixed meat			
minced meat	1	1	

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Salmonella in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Livingstone	S. Derby	S. Rissen	S. Hadar	S. Cerro	S. Infantis	S. Anatum	S. Ohio
Eggs																
table eggs																
- at packing centre	F	single	25g	41	3	2								1		
- at retail	F	single	25g	1653	46	13		10	7	2	6		1	2	4	1
raw material (liquid egg) for egg products	F	single	25g	98	1		1									
Egg products	F	single	25g	60	0											
Fishery products, unspecified	F	single	25g	450	0			0								
Live bivalve molluscs	F	single	25g	419	3			3								
Fish																
raw	F	single	25g	264	1			1								
Other processed food products and prepared dishes	F	single	25g	8559	14	4	4	6								
Bakery products																
desserts	F	single	25g	1590	2			2								
Vegetables	F	single	25g	212	0											

Other food	F	single	25g	714	29	20	4	1				4				

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

2.1.3. Salmonella in animals

A. Salmonella spp. in Gallus gallus - breeding flocks for egg production and flocks of laying hens

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Following point 2 of the Annex of Commission Regulation (EC) No 1003/ 2005 of 30 June 2005 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) No 2160/ 2003. This sampling strategy is implemented in the spanish National Survellance and Control Programme of Salmonella in Breeding Flocks of Gallus gallus, approved for co-financing by Commission Decisión 2006/ 875/ CE.

Laying hens flocks

Following point 2 of the Annex of Commission Regulation (EC) No 1168/ 2006 of 31 July 2006 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/ 2005. This sampling strategy is implemented in the spanish National Survellance and Control Programme of Salmonella in laying hengs, running since 2006.

Frequency of the sampling

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Every flock is sampled

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: birds of 4 weeks of age and 2 weeks prior moving

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Every 2 weeks

Laying hens: Day-old chicks

Every flock is sampled

Laying hens: Rearing period

2 weeks prior to moving

Laying hens: Production period

Every 15 weeks

Laying hens: Before slaughter at farm

In one flock per year per holding comprising at least 1000 birds maximun 9 weeks prior to slaughter

Type of specimen taken

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Internal linings of the deliveboxesry , dead chicks

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Faeces

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Faeces

Laying hens: Before slaughter at farm

Other: faecal material and dust samples

Methods of sampling (description of sampling techniques)

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Following point 2 of the Annex of Commission Regulation (EC) No 1003/ 2005 of 30 June 2005 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) No 2160/ 2003.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Following point 2 of the Annex of Commission Regulation (EC) No 1003/ 2005 of 30 June 2005 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) No 2160/ 2003.

Breeding flocks: Production period

Following point 2 of the Annex of Commission Regulation (EC) No 1003/ 2005 of 30 June 2005 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in breeding flocks of Gallus gallus and amending Regulation (EC) No 2160/ 2003.

Laying hens: Day-old chicks

Following part B of Annex II of Council Regulation 2160/ 2003.

Laying hens: Rearing period

Following part B of Annex II of Council Regulation 2160/ 2003.

Laying hens: Production period

Following point 2 of the Annex of Commission Regulation (EC) No 1168/ 2006 of 31 July 2006 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/ 2005. This sampling strategy is implemented in the spanish National Survellance and Control Programme of Salmonella in laying hengs, running since 2006.

Laying hens: Before slaughter at farm

Following point 2 of the Annex of Commission Regulation (EC) No 1168/ 2006 of 31 July 2006 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/ 2005. This sampling strategy is implemented in the spanish National Survellance and Control Programme of Salmonella in laying hengs, running since 2006. Samples are taken 9 weeks before slaughter.

Case definition

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

If positive in control, to confirm the disease official samples must be taken. The floch is confirmed as positive if Salmonella is isolated and serotyping in NRL is positive to one of the five serotypes included in the programme.

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

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Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

idem

Laying hens: Day-old chicks

A flock is considered positive if the presence of S. Enteritidis or S. Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

Laying hens: Rearing period

A flock is considered positive if the presence of S. Enteritidis and S. Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

Laying hens: Production period

A flock is considered positive if the presence of S. Enteritidis and S. Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

Laying hens: Before slaughter at farm

A flock is considered positive if the presence of S. Enteritidis and S. Typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

Diagnostic/ analytical methods used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Bacteriological method: ISO 6579:2002 MSRV

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Bacteriological method: ISO 6579:2002 MSRV

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Bacteriological method: ISO 6579:2002 MSRV

Laying hens: Day-old chicks

Bacteriological method: ISO 6579:2002

Laying hens: Rearing period

Bacteriological method: ISO 6579:2002

Laying hens: Production period

Bacteriological method: ISO 6579:2002

Laying hens: Before slaughter at farm

Other: ISO 6579:2002 MSRV

Vaccination policy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

voluntary

Laying hens flocks

Compulsory in rearing period against species of Salmonella with impact in public health.It can be voluntary in a holding if preventive and biosecurity measures have been taken taken on the holding, and the absence of Salmonella enteritidis and typhimurium was demostrated during the 12 months preceding the arrival of the animals.

Other preventive measures than vaccination in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

biosecurity measures
Compliance of Good Practice Guide

Laying hens flocks

-biosecurity measures
-compulsory notification
-compulsory surveillance and control programmes
-compliance of Good Practice Code

Control program/ mechanisms

The control program/ strategies in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

National control and monitoring programme on Salmonella in breeding flocks of Gallus gallus 2007, approved for co-financing by Commision Decision 2006/ 875/ CE.

Laying hens flocks

Control and Surveillace Programme on Salmonella in laying hens, as regards of setting up a National Programme, following Order PRE/ 1377/ 2005

Recent actions taken to control the zoonoses

Compulsory National Control Programmme of Salmonella in breeding flocks of Gallus gallus 2007, following criteria of Regulation 2160/ 2003, Regulation 1003/ 2005 and Regulation 1177/ 2006.
Surveillance and Control programme 2007 in holdings of laying hens, including vaccination, biosecurity measures and compliance of Good Practises Code and following criteria of

Regulation 2160/ 2003, Regulation 1168/ 2006 and Regulation 1177/ 2006.

Measures in case of the positive findings or single cases

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

According to spanihs National Control and Surveillance programme on Salmonella in Breeding flocks of Gallus Gallus, including:
movemment of live birds forbbiden
destruction or treatement of eggs
sacrifice-depopulation of the flock

Laying hens flocks

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Notification system in place

Since 1952, at least (Epizootic Diseases Law)
At the moment by Animal Health Law 8/ 2003, Royal Decree 328/ 2003 and Royal Decree 1940/ 2004.

Results of the investigation

Results of the investigation in breeding flocks:
Sampled flocks: 98
Positive flocks: 0 Salmonella spp; 0 top 5
Results of the investigation in laying hens:
Sampled flocks of laying hens: 771
Positive flocks: 209 Salmonella spp. 91 enteritidis+typhimurium
Prevalence Salmonella spp.: 27,11% (95%CI: 24,06;30,33)
- Salmonella enteritidis: 10,64% (flocks of laying hens in dust+faeces samples)
- Salmonella typhymurium: 1,17% (flocks of laying hens in dust+faeces samples)
- Salmonella enteritidis+typhimurium: 11,80% (95%CI: 9,66;14,22)

National evaluation of the recent situation, the trends and sources of infection

The prevalence of Salmonella ssp. is very low in brreding flocks and decresing in laying hens
The prevalence of top 5 Salmonella is 0% in breeding flocks
Control and monitoring programmes should be differentiated of the ones for breeding flocks for meat production
Breeding flocks for egg production can be considered as a very low source of infection for humans

B. Salmonella spp. in Gallus gallus - breeding flocks for meat production and broiler flocks

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when

necessary)

The same than in breeding flocks for egg production

Broiler flocks

Following point 1 of the Annex of Commission Regulation (EC) No 646/ 2007 of 12 June 2007 implementing Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/ 2005.

Frequency of the sampling

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Every flock is sampled

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Other: birds of 4 weeks of age and 2 prior moving

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Every 2 weeks

Broiler flocks: Before slaughter at farm

3 weeks prior to slaughter

Type of specimen taken

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Other: Internal linings of the deliveboxesry , dead chicks

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Faeces

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Other: Faeces, Dead chicks, Meconium

Broiler flocks: Before slaughter at farm

Faeces

Methods of sampling (description of sampling techniques)

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

The same than in breeding flocks for egg production

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

The same than in breeding flocks for egg production

Breeding flocks: Production period

The same than in breeding flocks for egg production

Broiler flocks: Before slaughter at farm

Following point 2 of the Annex of Commission Regulation (EC) No 646/ 2007 of 12 June 2007 implementing Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/ 2005.

Case definition

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

The same than in breeding flocks for egg production

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

The same than in breeding flocks for egg production

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

The same than in breeding flocks for egg production

Broiler flocks: Before slaughter at farm

A flock is considered positive if the presence of S. enteritidis or S. typhimurium is confirmed in at least one of the official samples. However, all serotypes shall be reported separately, including untypable serotypes.

Diagnostic/ analytical methods used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

Bacteriological method: ISO 6579:2002 MSRV

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

Bacteriological method: ISO 6579:2002 MSRV

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Bacteriological method: ISO 6579:2002 MSRV

Broiler flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Vaccination policy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

voluntary in general; compulsory if positive results after depopulation and before the first repopulation.

Broiler flocks

don´t exist

Other preventive measures than vaccination in place

Broiler flocks

bisecurity measures
compliance of Good Practice Code

Control program/ mechanisms

The control program/ strategies in place

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

The same than in breeding flocks for egg production

Broiler flocks

Control and Surveillance Plan on Salmonella in broiler flocks 2007, following Royal Decree 328/ 2003, laying down the Health Poultry Plan and Royal Decree 1084/ 2005, regarding the ordination of the poultry sector for meat production.

Recent actions taken to control the zoonoses

Compulsory National Control Programme of Sallmonella in breeding flocks of Gallus gallus 2007
Surveillance and Control Plan 2007 in broiler flocks, including biosecurity measures and compliance of Good Practices Code, Following Regulation 2160/ 2003, Regulation 1177/ 2006

and Regulation 646/ 2007

Measures in case of the positive findings or single cases

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Day-old chicks

The same than in breeding flocks for egg production

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Rearing period

The same than in breeding flocks for egg production

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

The same than in breeding flocks for egg production

Broiler flocks: Before slaughter at farm

verification of the compliance of the biosecurity measures
Cleaning, disinfection and treatment againts rodents and insects.
Verification of the efficacy of the disinfection

Notification system in place

Since 1952, al least(Epizootic Diseases Law).At the moment dy Animal Health Law 8/ 2003, Royal Decree 328/ 2003 and Royal Decree 1940/ 2004

Results of the investigation

Results of the investigation in breeding flocks:
Sampled flocks: 741
Positive flocks: 19 Salmonella spp. 18 top 5
Prevalence Salmonella spp.: 2,56 (95% CI: 1,59;3,90)
- prevalence top 5: 2,33 (95% CI: 1,49;3,74)
Results of investigation in broiler flocks:
Sampled flocks: 815
Positive flocks: 206 Salmonella spp. 91 S. enteritidis+typhimurium
Prevalence Salmonella spp.: 25,28% (95% CI: 22,38; 28,34)
- Salmonella enteritidis: 13.50%
- Salmonella typhimurium: 0,49%
- Salmonella enteritidis+typhimurium: 13,99% (95% CI: 11,73;16,49)

National evaluation of the recent situation, the trends and sources of infection

The prevalence of Salmonella ssp. has decreased very much in 2007 with the full implementation of the National Control Programme.

C. Salmonella spp. in turkey - breeding flocks and meat production flocks

Monitoring system

Sampling strategy

Breeding flocks (separate elite, grand parent and parent flocks when necessary)

Following article 2 of Commission Decision 2006/ 662/ EC, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States

Meat production flocks

Following article 2 of Commission Decision 2006/ 662/ EC, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States

Frequency of the sampling

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

9 weeks prior to slaughter

Meat production flocks: Before slaughter at farm

3 weeks prior to slaughter

Type of specimen taken

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Faeces

Meat production flocks: Before slaughter at farm

Faeces

Methods of sampling (description of sampling techniques)

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Following article 5 Commission Decision 2006/ 662/ EC, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States

Meat production flocks: Before slaughter at farm

Following article 5 Commission Decision 2006/ 662/ EC, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States

Case definition

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

A flock is considered positive for the purpose of this survey if the presence of Salmonella spp. is detected in at least one of the samples.

Meat production flocks: Before slaughter at farm

A flock is considered positive for the purpose of this survey if the presence of Salmonella spp. is detected in at least one of the samples.

Diagnostic/ analytical methods used

Breeding flocks (separate elite, grand parent and parent flocks when necessary): Production period

Bacteriological method: ISO 6579:2002

Meat production flocks: Before slaughter at farm

Bacteriological method: ISO 6579:2002

Case definition

A flock is considered positive for the purpose of this survey if the presence of Salmonella spp. is detected in at least one of the samples.

Results of the investigation

Results of investigation in breeding turkey flocks:
Sampled flocks: 10
Positive flocks: 1
Prevalence Salmonella spp.: flock prevalence: 10% (95% CI: 0,50;40,34)weighted prevalence: 5,3%
Prevalence Salmonella enteritidis+typhimurium: flock prevalence: 0%weighted prevalence: 0%
Results of investigation in fattening turkey flocks:
Sampled flocks: 380
Positive flocks: 203
Prevalence Salmonella spp.:
flock prevalence: 53,42% (95% CI: 48,40;58,40)weighted prevalence: 56,3%
Prevalence Salmonella enteritidis+typhimurium:
flock prevalence: 3,95% (95% CI: 2,31;6,28) weighted prevalence: 2,8%

D. Salmonella spp. in pigs

Monitoring system

Sampling strategy

Fattening herds

Following point 1 of the Annex of Commission Decision 2006/ 668/ EC, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States

Frequency of the sampling

Fattening herds at slaughterhouse (herd based approach)

Other: Annex I Decision 2006/ 668/ EC

Type of specimen taken

Fattening herds at slaughterhouse (herd based approach)

Other: ileocaecal limph nodes

Methods of sampling (description of sampling techniques)

Fattening herds at slaughterhouse (herd based approach)

Following point 2 of the Annex of Commission Decision 2006/ 668/ EC, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States

Case definition

Fattening herds at slaughterhouse (herd based approach)

An animal is considered positive for the purpose of this survey if the presence of Salmonella spp. is detected in the sample of ileo-caecal limph nodes

Diagnostic/ analytical methods used

Fattening herds at slaughterhouse (herd based approach)

Bacteriological method: ISO 6579:2002

Results of the investigation

Tested animals: 2637
Positive animals: 812 Salmonella spp.
306 TOP 5(Enteritidis+Typhimurium+Virchow+Infantis+Hadar)
Animal prevalence: 30,79% Salmonella spp.(95% CI: 29,05;32,57) weighted prevalence: 29.0%
11,60% Top 5 (95% CI: 10,42;12,87)

E. Salmonella spp. in bovine animals

Monitoring system

Sampling strategy

Sampling have been performed in 8 slaughterhouses placed in different regions of Spain and representative of the total volume of sacrifice of the country

Frequency of the sampling

Animals at slaughter (herd based approach)

Sampling takes place during the months june and november

Type of specimen taken

Animals at slaughter (herd based approach)

Faeces

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

Two faecal samples at colon level have been taken in all the slaughter batches in the day of sampling, with a maximun of 50 batches. Each batch belonged to different holdings.
Sampling has been performed in 8 slaughterhouses placed in Madrid, Barcelona, Murcia, Huesca, Lérida, Cáceres y Ciudad Real. These slaughterhouses have a high volume of activity, representing an important part of all the bovines sacrified in Spain.
A total of 326 samples have been taken, belonging to 163 slaughter batches and 163 different holdings.
Faeces were taken from the colon, refrigerated inmediatly and sent to the laboratory and analyzed before 24 hours.

Case definition

Animals at slaughter (herd based approach)

A slaughter batch is positive if Salmonella spp. has been isolated from at least one of the two samples of each slaughter batch.

Diagnostic/ analytical methods used

Animals at slaughter (herd based approach)

Bacteriological method: ISO 6579:2002

Results of the investigation

Number of slaughter batches analyzed: 163
Positive : 30
slaughter batch prevalence: 18,4% (IC 95%, 12,8-25,2)

Table Salmonella in breeding flocks of Gallus gallus

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	S. Hadar	S. Infantis	S. Virchow	Salmonella spp., unspecified
Gallus gallus (fowl)										
parent breeding flocks for egg production line										
during production period	A	flock	98	0	0	0	0	0	0	0
parent breeding flocks for meat production line										
during production period	A	flock	741	19	11	2	4	0	1	1
parent breeding flocks, unspecified										
during production period	A	flock	16	10	1	1				9

Footnote

A: Ministry of Environment and Rural and Marine Affairs (National Control Programme 2007)

Table Salmonella in other poultry

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. Hadar	S. London	S. Newport	S. Derby
Gallus gallus (fowl)											
laying hens											
during production period	A	flock	771	209	82	9	118				
broilers											
during rearing period	A	flock	815	206	110	4	92				
Turkeys											
breeding flocks	B	flock	10	1	0	0					1
meat production flocks (1)	B	flock	380	203	4	11	18	108	31	10	70

(1) : more than one serovar by sample have been introduced.

Footnote

A: Ministry of Environment and Rural and Marine Affairs (National Control Programme 2007)
B: Ministry of Environment and Rural and Marine Affairs (sampling in the framework of the baseline survey.

Table Salmonella in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified	S. 1,4,5,12:i:-	S. Derby	S. Mbandaka	S. Dublin	S. Rissen
Cattle (bovine animals)	A	slaughter batch	163	30	0	4	17			6	2	1
Sheep	B	animal	114	22			22					
Goats	B	animal	103	3			3					
Pigs												
breeding animals	D	herd	388	15			15					
fattening pigs	C	animal	2637	812	9	293	203	98	82			127

Footnote

A: Ministry of Environment and Rural and Marine Affairs. National survey.
B:Official Laboratories of Autonomous Communities(Serologic results in suspected clinical cases)
C:Ministry of Environment and Rural and Marine Affairs.EU- Baseline survey.
D:Animal Health Service of the region of Castilla y León. Surveillance Programme of Sanitary Private Entities (A.D.S.G)

2.1.4. Salmonella in feedingstuffs

Table Salmonella in feed material of animal origin

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of land animal origin								
meat and bone meal	A	batch	200	11	3			3
- at processing plant - domestic production - Surveillance - HACCP or own checks by industry - sampling by industry - census sampling	A	single	50	60	1			1
animal fat	A	batch	200	9	0			
- at processing plant - domestic production - Surveillance - HACCP or own checks by industry - sampling by industry - census sampling	A	single	50	60	0			
Feed material of marine animal origin								
fish meal	A	single	500 grs	9	7			7

Footnote

AUTONOMOUS COMMUNITIES OF VALENCIA, LA RIOJA, GALICIA AND ASTURIAS

Table Salmonella in other feed matter

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Enteritidis	S. Typhimurium	Salmonella spp., unspecified
Feed material of cereal grain origin								
barley derived	A	single	500 grs	46	1			1
- at feed mill - domestic production - Monitoring - official sampling - selective sampling	A	single	500grs	2	0			
wheat derived	A	single	500 grs	18	0			0
maize	A	single	500 grs	3	0			0
derived	A	single	500GRS	24	0			0
- at feed mill - Monitoring - official sampling - selective sampling	A	single	500grs	2	0			
other cereal grain derived	A	single	500grs	4	1			1
Feed material of oil seed or fruit origin								
palm kernel derived	A	single	500grs	3	1			1
soya (bean) derived	A	single	500 grs	27	7			7
cotton seed derived	A	single	500grs	20	12			12
sunflower seed derived	A	single	500 grs	5	0	0	0	0
linseed derived	A	single	500grs	1	0	0	0	0
Other feed material								
tubers, roots and similar products	A	single	500grs	1	0	0	0	0
forages and roughages								
- at feed mill - domestic production - Monitoring - official sampling - selective sampling	A	single	500	2	0			

Footnote

AUTONOMOUS COMMUNITIES OF ASTURIAS, LA RIOJA, GALICIA AND VALENCIA

Table Salmonella in compound feedingstuffs

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Salmonella spp.	S. Oranienburg	S. Typhimurium	S. Enteritidis	Salmonella spp., unspecified	S. Senftenberg	S. Anatum
Compound feedingstuffs for cattle											
final product	A	single	500grs	25	2		0	0	2		
Compound feedingstuffs for pigs											
final product	A	single	500 grs	50	2		0	0	2		
- at feed mill - domestic production - Monitoring - official sampling - selective sampling	A	single	500	4	0						
Compound feedingstuffs for poultry (non specified)											
final product	A	single	500grs	4	0						
Compound feedingstuffs for poultry - laying hens											
final product	A	single	500 grs	71	7	1	0	0	5	1	
Compund feedingstuffs for poultry - broilers											
final product **pelleted**	A	single	500 grs	23	3		0	0	3		
- at feed mill - domestic production - Monitoring - official sampling - selective sampling	A	single	500	1	0						

Footnote

AUTONOMOUS COMMUNITIES OF VALENCIA, LA RIOJA, GALICIA, ASTURIAS AND CANTABRIA

2.1.5. Salmonella serovars and phagetype distribution

Table Salmonella serovars in animals

Serovars		Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Other poultry	
Sources of isolates (*)		M	C	M	C	M	C	M	C
Number of isolates in the laboratory	N=	30		806		587		252	
Number of isolates serotyped	N=	30	0	806	0	587	0	252	0
Number of isolates per type									
S. Adelaide						1			
S. Agona		1		2		4			
S. Albany						1			
S. Altona		1				8			
S. Anatum		2		30		16			
S. Augustenborg				1					
S. Bardo				3		1			
S. Blockley						5			
S. Brandenburg				9					
S. Bredeney		2		28		6		3	
S. Brikama		1		3					
S. Cerro						1			
S. Choleraesuis				3					
S. Corvallis						3			
S. Dabou						2			
S. Derby				82		3		70	
S. Dublin		2							

S. Enteritidis			9		265		4	
S. Goldcoast			7					
S. Grumpensis			1		2			
S. Hadar			4		11		108	
S. Havana			1					
S. Heidelberg					1		1	
S. Indiana			1		6		1	
S. Infantis	1				36			
S. Istanbul			6					
S. Kentucky					5			
S. Kottbus							3	
S. Livingstone					5			
S. London			11		2		31	
S. Manhattan					2			
S. Mbandaka	6		2		6			
S. Meleagridis	1		1		3			
S. Mikawasima			5		3			
S. Montevideo	4		6		4		3	
S. Muenchen			4		3		1	
S. Muenster							2	
S. Newport			9		7		10	
S. Offa			1					
S. Ohio			1		11			
S. Oranienburg					1			
S. Orion							1	
S. Rissen	1		126		5			
S. Saintpaul							1	
S. Senftenberg					3		2	
S. Tennessee					3			
S. Thompson					2			
S. Typhimurium	4		291		16		11	
S. Virchow					6			

S. 4,12:b:-					1			
S. 4,5,12:i:-			97					
Not typeable	4		62		127			

Footnote

(*) M : Monitoring, C : Clinical
other poultry: turkeys
gallus gallus: breeding flocks,laying hens and broilers

2.1.6. Antimicrobial resistance in Salmonella isolates

The methods of collecting, isolating and testing of the Salmonella isolates are described in the chapters above respectively for each animal species, foodstuffs and humans. The serotype and phagetype distributions can be used to investigate the sources of the Salmonella infections in humans. Findings of same serovars and phagetypes in human cases and in foodstuffs or animals may indicate that the food category or animal species in question serves as a source of human infections. However as information is not available from all potential sources of infections, conclusions have to be drawn with caution.

A. Antimicrobial resistance in Salmonella in cattle

Sampling strategy used in monitoring

Frequency of the sampling

see text form on Sallmonella spp. in bovine animals

Type of specimen taken

see text form on Sallmonella spp. in bovine animals

Methods of sampling (description of sampling techniques)

see text form on Sallmonella spp. in bovine animals

Procedures for the selection of isolates for antimicrobial testing

all positive samples (30)

Methods used for collecting data

national survey

Laboratory methodology used for identification of the microbial isolates

see text form on Sallmonella spp. in bovine animals

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see table on antimicrobial resistance in Salmonella in cattle

Breakpoints used in testing

see table of breakpoints

Results of the investigation

see table

B. Antimicrobial resistance in Salmonella in pigs

Sampling strategy used in monitoring

Frequency of the sampling

There has been a specific monitoring programme for antimicrobial surveillance running from 1999 at national level in Spain. From 01/ 10/ 2006 to 01/ 10/ 2007 a baseline study on the prevalence on Salmonella in fattening pigs was performed a UE level. The data used in the report 2007 belongs to this baseline survey. Then, the sampling strategy and frecuency are the ones of the anenex I of Commission Decision 2006/ 668/ CE,concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States.

Type of specimen taken

ileocaecal limph nodes

Methods of sampling (description of sampling techniques)

Point 2.1 of Annex I of Commission Decision 2006/ 668/ CE,concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States.

Procedures for the selection of isolates for antimicrobial testing

Following point 4.5 of Commission Decision 2006/ 668/ CE,concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States.

Methods used for collecting data

Following aticle 2 of Commision Decision 2007/ 407/ CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Laboratory methodology used for identification of the microbial isolates

Following point 4. of Annex I of Commission Decision 2006/ 668/ CE,concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Those included in point 4.5 of Annex I of Commission Decision 2006/ 668/ CE,concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in slaughter pigs to be carried out in the Member States.

Breakpoints used in testing

Those included in point 4. of the Annex of Commision Decision 2007/ 407/ CE, concerning a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

C. Antimicrobial resistance in Salmonella in poultry

Sampling strategy used in monitoring

Frequency of the sampling

National antimicrobial resistance surveillance programme has been running from 2003 at national level. In 2007, control programmes has been applied in laying hens and broilers. Then, sampling strategies and frequency of sampling has been performed following Commission Regulation (EC) No 1168/ 2006 of 31 July 2006 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/ 2005 and Commission Regulation (EC) No 646/ 2007 of 12 June 2007 implementing Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/ 2005.
In turkeys, a baseline survey on the prevalence of Salmonella has been performed from 01/ 10/ 2006 to 31/ 09/ 2007. Then, data used in the report 2007 (sampling strategy and frequency of sampling) are the ones specified in the technical specifications of article 5 of Commission Decision 2006/ 662/ CE, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States.

Type of specimen taken

Laying hens: following point 2.2. of the Annex of Commission Regulation (EC) No 1168/ 2006 of 31 July 2006 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/ 2005.
Broilers: point 2 of the Annex of Commission Regulation (EC) No 646/ 2007 of 12 June 2007 implementing Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/ 2005
Turkeys: following chapter 4 of technical specifications of article 5 of Commission Decision 2006/ 662/ CE, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States.

Methods of sampling (description of sampling techniques)

Laying hens: following point 2.2. of the Annex of Commission Regulation (EC) No 1168/ 2006 of 31 July 2006 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/ 2005.
Broilers: point 2 of the Annex of Commission Regulation (EC) No 646/ 2007 of 12 June 2007 implementing Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/ 2005
Turkeys: following chapter 4 of technical specifications of article 5 of Commission Decision

2006/ 662/ CE, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States.

Procedures for the selection of isolates for antimicrobial testing

Following ponit 2 of the Annex of Commision Decision 2007/ 407/ CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Methods used for collecting data

Following aticle 2 of Commision Decision 2007/ 407/ CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Laboratory methodology used for identification of the microbial isolates

Laying hens: following point 3 of the Annex of Commission Regulation (EC) No 1168/ 2006 of 31 July 2006 implementing Regulation (EC) No 2160/ 2003 as regards a Community target for the reduction of the prevalence of certain salmonella serotypes in laying hens of Gallus gallus and amending Regulation (EC) No 1003/ 2005.
Broilers: point 3 of the Annex of Commission Regulation (EC) No 646/ 2007 of 12 June 2007 implementing Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council as regards a Community target for the reduction of the prevalence of Salmonella enteritidis and Salmonella typhimurium in broilers and repealing Regulation (EC) No 1091/ 2005
Turkeys: following chapter 5 of technical specifications of article 5 of Commission Decision 2006/ 662/ CE, of 29 September 2006, concerning a financial contribution from the Community towards a baseline survey on the prevalence of Salmonella in turkeys to be carried out in the Member States.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

Following point 4 of the Annex of Commision Decision 2007/ 407/ CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Breakpoints used in testing

Following point 4 of the Annex of Commision Decision 2007/ 407/ CE, on a harmonized monitoring scheme of antimicrobial resistance in Salmonella in fowl (Gallus gallus) and pigs.

Preventive measures in place

Article 2 of Commission Regulation (EC) No 1177/ 2006 of 1 August 2006 implementing Regulation (EC) No 2160/ 2003 of the European Parliament and of the Council as regards requirements for the use of specific control methods in the framework of the national programmes for the control of salmonella in poultry.

Control program/ mechanisms

The control program/ strategies in place

Spanish control programmes of Salmonella in breeding flocks of Gallus gallus, laying hens and

broilers.

Recent actions taken to control the zoonoses

Spanish control programmes of Salmonella in breeding flocks of Gallus gallus, laying hens and broilers.

Measures in case of the positive findings or single cases

Spanish control programmes of Salmonella in breeding flocks of Gallus gallus, laying hens and broilers.

Notification system in place

Spanish control programmes of Salmonella in breeding flocks of Gallus gallus, laying hens and broilers.

Table Antimicrobial susceptibility testing of S. Derby in Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Derby
	Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	66

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	66	1					37	21	7				1									
Neomycin	8	66	63						2	1						63							
Streptomycin	32	66	4							4	33	6	15	4		4							
Amphenicols																							
Chloramphenicol	16	66	21								1	37	7	3	2	10		6					
Florfenicol	16	66	3								13	31	19	3									
Cephalosporins																							
Cefotaxim	0.5	66	1		2	42	17	4				1											
Fluoroquinolones																							
Ciprofloxacin	0.06	66	62		4	1	41	19	1														
Penicillins																							
Amoxicillin	4	66	63						3									63					
Quinolones																							
Nalidixic acid	16	66	18							2	2	11	33	6	1		11						
Tetracyclines																							
Tetracyclin	8	66	65							1					7	56		2					

Table Antimicrobial susceptibility testing of S. Derby in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Derby
	Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	15

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	15	2				2	9	1	1	1			1									
Kanamycin	8	6	0								5	1											
Neomycin	8	4	0						1	3													
Streptomycin	32	15	11								1	1	1	1		9	2						
Amphenicols																							
Chloramphenicol	16	15	1								8	6						1					
Florfenicol	16	15	0							1	11	3											
Cephalosporins																							
Cefotaxim	0.5	15	0			11	4																
Ceftazidim	0.5	6	1					5	1														
Fluoroquinolones																							
Ciprofloxacin	0.06	15	2	6	7		2																
Penicillins																							
Amoxicillin	4	9	3						4	2								3					
Ampicillin	4	6	0						4	2													
Polymyxins																							
Colistin	8	6	0									6											
Quinolones																							
Nalidixic acid	16	15	2							2	11						2						
Sulfonamides																							
Sulfonamide	256	6	5													1				5			

Tetracyclines																							
Tetracyclin	8	15	14							1					7	7							
Trimethoprim	2	6	1						5						1								

Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Enteritidis
	Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	102

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	102	2				33	56	10	1						2							
Neomycin	8	101	0					39	52	9	1												
Streptomycin	32	102	0							34	57	9	1	1									
Amphenicols																							
Chloramphenicol	16	102	2								16	82	2	1	1								
Florfenicol	16	102	1								91	10			1								
Cephalosporins																							
Cefotaxim	0.5	103	4	1	20	68	8	2		2		2											
Fluoroquinolones																							
Ciprofloxacin	0.06	102	97		5	12	78	6	1														
Penicillins																							
Amoxicillin	4	102	10						49	28	15	2				1	7						
Quinolones																							
Nalidixic acid	16	102	97								4	1					97						
Tetracyclines																							
Tetracyclin	8	102	2						24	73	2	1				2							

Table Antimicrobial susceptibility testing of S. Enteritidis in Gallus gallus (fowl) - laying hens - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Enteritidis
	Gallus gallus (fowl) - laying hens - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	83

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	83	0				40	39	4														
Kanamycin	8	83	1								79	3					1						
Streptomycin	32	83	0							16	58	8	1										
Amphenicols																							
Chloramphenicol	16	83	0								11	72											
Florfenicol	16	83	0								71	12											
Cephalosporins																							
Cefotaxim	0.5	83	0		24	53	5	1															
Ceftazidim	0.5	83	1				74	8			1												
Fluoroquinolones																							
Ciprofloxacin	0.06	83	26	55	2	12	13	1															
Penicillins																							
Ampicillin	4	83	2						19	60	2				2								
Quinolones																							
Nalidixic acid	16	83	25								52	4	2			25							
Sulfonamides																							
Sulfonamide	256	83	0											20	53	9	1						
Tetracyclines																							
Tetracyclin	8	83	2						5	74	2					2							
Trimethoprim	2	83	1					78	4				1										

Table Antimicrobial susceptibility testing of S. Enteritidis in Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Enteritidis
	Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	4

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	4	0					4															
Neomycin	8	4	0						4														
Streptomycin	32	4	0							2	2												
Amphenicols																							
Chloramphenicol	16	4	0								1	3											
Florfenicol	16	4	0								2	2											
Cephalosporins																							
Cefotaxim	0.5	4	0		1	3																	
Fluoroquinolones																							
Ciprofloxacin	0.06	4	3		1		3																
Penicillins																							
Amoxicillin	4	4	2						2									2					
Quinolones																							
Nalidixic acid	16	4	3								1						3						
Tetracyclines																							
Tetracyclin	8	4	0						1	3													

Table Antimicrobial susceptibility testing of S. Enteritidis in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Enteritidis
	Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	7

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	7	0				2	2	2	1													
Kanamycin	8	3	0								3												
Neomycin	8	1	0					1															
Streptomycin	32	7	0							2	5												
Amphenicols																							
Chloramphenicol	16	7	0								5	2											
Florfenicol	16	7	0								7												
Cephalosporins																							
Cefotaxim	0.5	7	0		2	5																	
Ceftazidim	0.5	3	0				3																
Fluoroquinolones																							
Ciprofloxacin	0.06	7	0	3	4																		
Penicillins																							
Amoxicillin	4	4	0						3	1													
Ampicillin	4	3	0						3														
Polymyxins																							
Colistin	8	3	0									3											
Quinolones																							
Nalidixic acid	16	7	0								6	1											
Sulfonamides																							
Sulfonamide	256	3	0												3								

Tetracyclines																							
Tetracyclin	8	7	0						2	5													
Trimethoprim	2	3	0						3														

Table Antimicrobial susceptibility testing of S.Enteritidis in animals

n = Number of resistant isolates

S. Enteritidis

	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers	
Isolates out of a monitoring programme			yes				yes		yes		yes	
Number of isolates available in the laboratory			7				4		83		102	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides												
Gentamicin			7	0					83	0	102	2
Kanamycin									83	1		
Neomycin											102	0
Streptomycin			7	0					83	0	102	0
Amphenicols												
Chloramphenicol			7	0					83	0	102	2
Florfenicol			7	0					83	0	102	1
Cephalosporins												
Cefotaxim			7	0					83	0	102	2
Ceftazidim									83	1		
Fluoroquinolones												
Ciprofloxacin			7	0					83	26	102	97
Penicillins												
Amoxicillin			4	0							102	10
Ampicillin			3	0					83	2		
Polymyxins												
Colistin			7	0								
Quinolones												
Nalidixic acid			7	0					83	25	102	97
Sulfonamides												
Sulfonamide			7	3					83	0		
Tetracyclines												
Tetracyclin			7	0					83	2	102	2
Trimethoprim			7	0					83	1		

Table Antimicrobial susceptibility testing of S. Hadar in Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - quantitative data [Dilution method]

	S. Hadar
	Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	38

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	38	0				1	24	11	2													
Neomycin	8	38	1						24	10	2	1				1							
Streptomycin	32	38	34									1	1	2	5	29							
Amphenicols																							
Chloramphenicol	16	38	0								2	35	1										
Florfenicol	16	38	0								35	2	1										
Cephalosporins																							
Cefotaxim	0.5	38	0		4	25	8	1															
Fluoroquinolones																							
Ciprofloxacin	0.06	38	38				32	5	1														
Penicillins																							
Amoxicillin	4	38	4						17	9	8							4					
Tetracyclines																							
Tetracyclin	8	38	37						1						34	3							

Table Antimicrobial susceptibility testing of S. Hadar in Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Hadar
	Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	94

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	94	4				3	44	41	2	1	1	2										
Neomycin	8	94	65						15	13	1			1		64							
Streptomycin	32	94	69								2	10	9	4		69							
Amphenicols																							
Chloramphenicol	16	94	9								3	42	40	4	2	1		2					
Florfenicol	16	94	1								17	54	22	1									
Cephalosporins																							
Cefotaxim	0.5	94	3		5	20	49	17	1			2											
Fluoroquinolones																							
Ciprofloxacin	0.06	94	94				17	44	31		1		1										
Penicillins																							
Amoxicillin	4	94	87						5	2								87					
Quinolones																							
Nalidixic acid	16	94	91									1	2	1			90						
Tetracyclines																							
Tetracyclin	8	94	74							15	5			2	17	55							

Table Antimicrobial susceptibility testing of S. Rissen in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Rissen
	Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	13

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	13	0				1	8	4														
Kanamycin	8	6	0								6												
Neomycin	8	3	0					1		2													
Streptomycin	32	13	1								3	7	1	1		1							
Amphenicols																							
Chloramphenicol	16	13	2									11			1	1							
Florfenicol	16	13	0								5	7	1										
Cephalosporins																							
Cefotaxim	0.5	13	0			12	1																
Fluoroquinolones																							
Ciprofloxacin	0.06	13	0	6	7																		
Penicillins																							
Amoxicillin	4	7	3						2	2						1		2					
Ampicillin	4	6	1						5						1								
Polymyxins																							
Colistin	8	6	0									6											
Quinolones																							
Nalidixic acid	16	13	0							1	12												
Sulfonamides																							
Sulfonamide	256	6	2												1	3				2			
Tetracyclines																							

Tetracyclin	8		13	11					1		1						11								
Trimethoprim	2		6	2						4						2									

Table Antimicrobial susceptibility testing of S.Typhimurium in animals

n = Number of resistant isolates

S. Typhimurium

	Cattle (bovine animals)		Pigs		Gallus gallus (fowl)		Turkeys		Gallus gallus (fowl) - laying hens		Gallus gallus (fowl) - broilers	
Isolates out of a monitoring programme			yes				yes		yes		yes	
Number of isolates available in the laboratory			19				9		10		5	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides												
Gentamicin			19	2								
Streptomycin			19	8								
Amphenicols												
Chloramphenicol			19	15								
Florfenicol			19	5								
Cephalosporins												
Cefotaxim			19	0								
Fluoroquinolones												
Ciprofloxacin			19	2								
Fully sensitive			6	0								
Penicillins												
Amoxicillin			13	11								
Quinolones												
Nalidixic acid			19	2								
Sulfonamides												
Sulfonamide			19	18								
Tetracyclines												
Tetracyclin			19	16								
Trimethoprim			19	3								

Table Antimicrobial susceptibility testing of S. Typhimurium in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Typhimurium
	Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	19

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	19	2				8	5	4					2									
Neomycin	8	2	0					1	1														
Streptomycin	32	19	8								2	1	1	7	4	3	1						
Amphenicols																							
Chloramphenicol	16	19	15								1	3		1	2	6	2	4					
Florfenicol	16	19	5								7	4	3	3		1	1						
Cephalosporins																							
Cefotaxim	0.5	19	0		3	8	6	2															
Ceftazidim	0.5	6	0				2	4															
Fluoroquinolones																							
Ciprofloxacin	0.06	19	2	4	13		2																
Penicillins																							
Amoxicillin	4	13	11						1	1							1	10					
Ampicillin	4	6	6												6								
Polymyxins																							
Colistin	8	6	0									6											
Quinolones																							
Nalidixic acid	16	19	2								14	3					2						
Sulfonamides																							
Sulfonamide	256	6	6																	6			
Tetracyclines																							

Tetracyclin	8	19	16							3				4	1	9	1	1						
Trimethoprim	2	6	2						4						2									

Table Antimicrobial susceptibility testing of S. Typhimurium in Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Typhimurium
	Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	9

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	9	0					9															
Neomycin	8	9	1					1	6	1						1							
Streptomycin	32	9	7									1	1			7							
Amphenicols																							
Chloramphenicol	16	9	5									3	1					5					
Florfenicol	16	9	5								2	2			4		1						
Cephalosporins																							
Cefotaxim	0.5	9	0		6		3																
Penicillins																							
Amoxicillin	4	9	8						1									8					
Quinolones																							
Nalidixic acid	16	9	2								5	2					2						
Tetracyclines																							
Tetracyclin	8	9	8							1				3	2	3							

Table Antimicrobial susceptibility testing of S. Typhimurium in Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Typhimurium
	Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	5

Antimicrobials:				Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																			
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	5	0					5															
Neomycin	8	5	0					1	3	1													
Streptomycin	32	5	4										1		1	3							
Amphenicols																							
Chloramphenicol	16	5	3									2					1	2					
Florfenicol	16	5	3								2				3								
Cephalosporins																							
Cefotaxim	0.5	5	0		2	2	1																
Fluoroquinolones																							
Ciprofloxacin	0.06	5	4		1	2	1	1															
Penicillins																							
Amoxicillin	4	5	4						1									4					
Quinolones																							
Nalidixic acid	16	5	4								1						4						
Tetracyclines																							
Tetracyclin	8	5	4							1					3	1							

Table Antimicrobial susceptibility testing of S. Typhimurium in Gallus gallus (fowl) - laying hens - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	S. Typhimurium
	Gallus gallus (fowl) - laying hens - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	10

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	10	0					7	3														
Kanamycin	8	10	1								9						1						
Streptomycin	32	10	0									1	7	2									
Amphenicols																							
Chloramphenicol	16	10	0									10											
Florfenicol	16	10	0								4	6											
Cephalosporins																							
Cefotaxim	0.5	10	0		7	3																	
Ceftazidim	0.5	10	0				9	1															
Fluoroquinolones																							
Ciprofloxacin	0.06	10	1	9		1																	
Penicillins																							
Ampicillin	4	10	0						7	3													
Quinolones																							
Nalidixic acid	16	10	1								8	1				1							
Sulfonamides																							
Sulfonamide	256	10	0												1	7	2						
Tetracyclines																							
Tetracyclin	8	10	1							8	1					1							
Trimethoprim	2	10	0					10															

Table Antimicrobial susceptibility testing of S. Virchow in Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - quantitative data [Dilution method]

	S. Virchow
	Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	16

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	16	5				2	4	4	1	2	1	1	1									
Neomycin	8	16	0					1	11	3	1												
Streptomycin	32	16	3								1	1	8	3		3							
Amphenicols																							
Chloramphenicol	16	16	2								2	12						2					
Florfenicol	16	16	0								10	6											
Cephalosporins																							
Cefotaxim	0.5	16	6		4	5	1					6											
Penicillins																							
Amoxicillin	4	16	7						3	5	1							7					
Quinolones																							
Nalidixic acid	16	16	16												1		15						
Tetracyclines																							
Tetracyclin	8	16	2						6	7	1				1	1							

Table Antimicrobial susceptibility testing of Salmonella spp. in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	Salmonella spp.
	Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	30

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	30	0				3	21	6														
Neomycin	8	30	0					1	17	10	2												
Streptomycin	32	30	4								2	11	9	4		4							
Amphenicols																							
Chloramphenicol	16	30	0							11	18	1											
Florfenicol	16	30	0								28	2											
Cephalosporins																							
Cefotaxim	0.5	30	0		8	17	5																
Fluoroquinolones																							
Ciprofloxacin	0.06	30	0		30																		
Penicillins																							
Amoxicillin	4	30	6						22	1	1						2	4					
Quinolones																							
Nalidixic acid	16	30	0							23	7												
Tetracyclines																							
Tetracyclin	8	29	12						12	1	1	3		1	3	8							

Footnote

12 diferent serovars including 4 Typhimurium strains and 1 Infantis strain

Table Antimicrobial susceptibility testing of Salmonella spp. in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	Salmonella spp. Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	30

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																	
Amikacin	14	30	0															2	9	12	5		2										
Apramycin	13	30	0																		3	15	9	2	1								
Carbapenems																																	
Imipenem	13	30	0																								1	12	8	8	1		
Cephalosporins																																	
Cefoxitin	14	30	0																2	2	4	4	9	1	5	2	1						
Ceftazidim	14	30	0																						1	8	4	5	7	2	1	2	
Monobactams																																	
Aztreonam	15	30	0																							1				1	3	8	17
Polymyxins																																	
Colistin	14	30	0												6	24																	
Sulfonamides																																	
Sulfonamide	12	30	9	9														2	5	5	1	4		2		1	1						
Trimethoprim	10	30	7	7																				1	1	11	4	4	2				

Table Antimicrobial susceptibility testing of Other serotypes in Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	Other serotypes
	Gallus gallus (fowl) - broilers - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	40

Antimicrobials:				Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																			
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	40	0				1	29	8	2													
Neomycin	8	40	13					4	17	6						13							
Streptomycin	32	40	18								2	6	11	3		18							
Amphenicols																							
Chloramphenicol	16	40	3								10	26	1					3					
Florfenicol	16	40	0								26	13	1										
Cephalosporins																							
Cefotaxim	0.5	40	13		5	12	10		1			12											
Fluoroquinolones																							
Ciprofloxacin	0.06	40	26		14	11	11	3	1														
Penicillins																							
Amoxicillin	4	40	19						7	11	3	1						18					
Quinolones																							
Nalidixic acid	16	40	23							1	14	1	1		1		22						
Tetracyclines																							
Tetracyclin	8	40	20						3	16	1		1		18	1							

Table Antimicrobial susceptibility testing of Other serotypes in Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	Other serotypes
	Turkeys - at farm - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	54

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	54	1				1	28	19	5						1							
Neomycin	8	54	32					1	12	8	1					32							
Streptomycin	32	54	13							1	2	4	17	17		13							
Amphenicols																							
Chloramphenicol	16	54	32								1	14	7		3	22		7					
Florfenicol	16	54	0								9	14	31										
Cephalosporins																							
Cefotaxim	0.5	54	1	1	21	18	9	4		1													
Fluoroquinolones																							
Ciprofloxacin	0.06	54	44		10	2	26	9	6	1													
Penicillins																							
Amoxicillin	4	54	41						10	2	1							41					
Quinolones																							
Nalidixic acid	16	54	26								9	2	17	1			25						
Tetracyclines																							
Tetracyclin	8	54	38						6	8	1	1	1	1	7	29							

Table Antimicrobial susceptibility testing of Other serotypes in Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling - quantitative data [Dilution method]

	Other serotypes
	Pigs - fattening pigs - at slaughterhouse - animal sample - lymph nodes - Control or eradication programmes - co-financed by Community - official sampling
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	113

	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
Antimicrobials:	**Break point**	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	113	8				17	52	31	5	1		1	2	4								
Kanamycin	8	62	6								47	9	3				3						
Neomycin	8	29	1					6	12	9		1				1							
Streptomycin	32	113	36							2	12	30	26	7	17	11	8						
Amphenicols																							
Chloramphenicol	16	113	19							2	57	31	4	2	4	10	2	1					
Florfenicol	16	112	2							3	85	16	6	2									
Cephalosporins																							
Cefotaxim	0.5	113	1		27	78	7					1											
Ceftazidim	0.5	62	2				37	23	1					1									
Fluoroquinolones																							
Ciprofloxacin	0.06	113	26	43	44	2	10	13	1														
Penicillins																							
Amoxicillin	4	51	11						31	9						1	1	9					
Ampicillin	4	62	22					2	34	4					22								
Polymyxins																							
Colistin	8	62	0									62											
Quinolones																							
Nalidixic acid	16	113	24							4	77	7	1			11	13						
Sulfonamides																							
Sulfonamide	256	62	32										1	2	15	9	3	2	2	28			

Tetracyclines																							
Tetracyclin	8	113	54						24	33	1	1	1	2	16	33	2						
Trimethoprim	2	62	23					38	1				1	1	21								

Table Breakpoints for antibiotic resistance testing in Animals

Test Method Used

Disc diffusion

Broth dilution

Standards used for testing

NCCLS

EFSA_J

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol	EFSAJ/ VAV			16	2	256				
Florfenicol	VAV			16	4	128				
Tetracyclines										
Tetracyclin	EFSA J			8	0.5	256				
Fluoroquinolones										
Ciprofloxacin	EFSAJ/ VAV			0.06	0.06	32				
Enrofloxacin										
Quinolones										
Nalidixic acid	EFSA J			16	0.5	128				
Trimethoprim	EFSA J./ VAV			2	0.5	32	5			10
Sulfonamides										
Sulfonamide	EFSA J./ VAV			256	8	1024	300			12
Aminoglycosides										
Streptomycin	EFSA J			32	2	64				
Gentamicin	EFSA J			2	0.25	64				
Neomycin	VAV			8	0.25	64				
Kanamycin	EUCAST			8	4	128				
Amikacin	VAV						30			14
Apramycin (1)	VAV						40			13
Trimethoprim + sulfonamides										
Carbapenems										
Imipenem	VAV						10			13
Cephalosporins										
Cefotaxim	EFSA J			0.5	0.03	4				
Cefoxitin	VAV						30			14
Ceftazidim	EUCAST/ VAV			0.5	0.25	16	30			14
3rd generation cephalosporins										
Monobactams										
Aztreonam	VAV						30			15
Penicillins										
Amoxicillin (2)	VAV			4	1	256				
Ampicillin	EFSA J.			4	0.5	32				
Polymyxins										
Colistin (3)	DANMAP			8	8	16	50			14

(1) : Rosco tablets
(2) : The EFSA J. publihsed breakpoint for ampicillin was uses also for amoxicillin.
(3) : Diffusion breakpoint according to SFM-VET 2008

Table Breakpoints for antibiotic resistance testing in Food

Test Method Used

Standards used for testing

NCCLS

Salmonella	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol							30	18	13	12
Florfenicol										
Tetracyclines										
Tetracyclin										
Fluoroquinolones										
Ciprofloxacin										
Enrofloxacin										
Quinolones										
Nalidixic acid										
Trimethoprim										
Sulfonamides										
Sulfonamide										
Aminoglycosides										
Streptomycin										
Gentamicin										
Neomycin										
Kanamycin										
Amikacin										
Apramycin										
Trimethoprim + sulfonamides										
Carbapenems										
Imipenem										
Cephalosporins										
Cefotaxim										
Cefoxitin										
Ceftazidim										
3rd generation cephalosporins										
Monobactams										
Aztreonam										
Penicillins										
Amoxicillin										
Ampicillin										
Polymyxins										
Colistin										

2.2. CAMPYLOBACTERIOSIS

2.2.1. General evaluation of the national situation

A. Thermophilic Campylobacter general evaluation

History of the disease and/ or infection in the country

Campylobacter spp. is at the moment one of the most frequent causes of gastroenteritis in humans.Poultry are the main reservoir, and infection happens usually by consume of poultry meat.
Until the end of the 60's importance of Campylobacter spp. was not valued.
Notification of the disease is also infravaluated in surveillance systems.Epidemiology investigations associated cases to poultry meat consume and a deficient handle of food.
The number of human cases in Spain is at the moment supported in the notification maken to Microbiology Information System (SIM).

National evaluation of the recent situation, the trends and sources of infection

Poultry meat is the main source of infection.Another food implicated are red meat, raw milk, non pasteurized cheese, and water.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

More studies need to de developed. In 2007, surveys have been performed in broilers, cattle and pigs with the scientific assesement of Animal Health Departement of Veterinary College-Universidad Complutense de Madrid

Recent actions taken to control the zoonoses

Surveillance of the zoonoses according to Council Directive 2003/ 99/ EEC.

2.2.2. Campylobacter in foodstuffs

A. Thermophilic Campylobacter in Broiler meat and products thereof

Monitoring system

Sampling strategy

At slaughterhouse and cutting plant

The activities are made according to Regulation (EC) no 178/ 2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs) must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.

Frequency of the sampling

At slaughterhouse and cutting plant

Sampling distributed evenly throughout the year

At meat processing plant

Sampling distributed evenly throughout the year

At retail

Sampling distributed evenly throughout the year

Type of specimen taken

At slaughterhouse and cutting plant

Other: fresh meat and skin

At meat processing plant

Other: fresh meat and skin

At retail

Other: fresh meat and skin

Diagnostic/ analytical methods used

At slaughterhouse and cutting plant

Other: bacteriological method: ISO 10272:2006

At meat processing plant

Other: Bacteriological method:ISO10272:2006

At retail

Other: Bacteriological method: ISO 10272:2006

Table Campylobacter in poultry meat

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. coli	C. lari	C. upsaliensis	C. jejuni	Thermophilic Campylobacter spp., unspecified
Meat from broilers (Gallus gallus)										
fresh										
- at slaughterhouse	F	single	25g	147	82	7			14	61
- at retail	F	single	25g	208	64	6			17	41
- at cutting plant	F	single	25g	168	29	3			9	17
meat products										
- at processing plant	F	single	25g	2	0					
- at retail	F	single	25g	355	1				1	

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Campylobacter in other food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. upsaliensis	C. lari	Thermophilic Campylobacter spp., unspecified
Meat from pig										
fresh										
- at retail	F	single	25g	36	0					
- at cutting plant	F	single	25g	3	0					
meat products										
- at processing plant	F	single	25g	42	0					
- at retail	F	single	25g	11	0					
Meat from bovine animals										
fresh										
- at retail	F	single	25g	1	0					
Meat from other animal species or not specified										
fresh										
- at cutting plant	F	single	25g	1	0					
Meat, mixed meat										
minced meat	F	single	25g	108	4		1			3
Dairy products (excluding cheeses)										
dairy products, not specified										
ready-to-eat	F	single	25g	66	0					
Cheeses, made from unspecified milk or other animal milk	F	single	25g	30	0					
Fishery products, unspecified	F	single	25g	1	0					
Eggs	F	single	25g	3	0					
Other processed food products and prepared dishes	F	single	25g	114	0					

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

2.2.3. Campylobacter in animals

A. Thermophilic Campylobacter in Gallus gallus

Monitoring system

Sampling strategy

Sampling stategy is random, stratified by regions (slaughterhouses of 7 regions)and representative of the total volume of sacrifice of the country.
3 samples have been taken from each slaughter batch, belonging to different flocks.
89 slaughter batches (flocks)have been sampled.

Frequency of the sampling

At slaughter

Sampling takes place during the months from may to november

Type of specimen taken

At slaughter

Organs: intact caecae

Methods of sampling (description of sampling techniques)

At slaughter

caecum
3 samples by slaughter batch

Case definition

At slaughter

one slaughter batch is consedered positive if isolation of Campylobacter spp. by bacteriological method and identification by PCR

Diagnostic/ analytical methods used

At slaughter

Bacteriological method: isolation in agar CCDA and PCR

Vaccination policy

don't exist

Other preventive measures than vaccination in place

biosecurity measures, implementation of good higyene practises

Control program/ mechanisms

The control program/ strategies in place

don't exist

Results of the investigation

Number of slaughter batches tested: 89
Number of slaughter batches positive: 41
Slaughter batch prevalence: 46% Campylobacter spp. (95% CI: 35.92; 56.46)

National evaluation of the recent situation, the trends and sources of infection

More studies need to be performed

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

More studies need to be performed

B. thermophilic Campylobacter spp., unspecified in animal - Pigs - fattening pigs

Monitoring system

Sampling strategy

Samples have been taken randomly in 8 representative slaughterhouses of Spain.
Samples have been taken only if the slaughter batch had 10 or more animals, and belonging to different herds.
Samples taken between march and september
Number of samples: 460, belonging to 230 slaughter batches (different herds)

Frequency of the sampling

2 faecal samples by slaughter batch with 10 animals or more, with a máximun of 30 slaughter batches by slaughterhouse and day and mounth of sampling.

Type of specimen taken

Faeces

Methods of sampling (description of sampling techniques)

2 faecal material samples by slaughter batch and by herd

Case definition

a slaughter batch is considered as positive if isolation by bacteriological method and PCR identification

Diagnostic/ analytical methods used

isolation in agar CCDA and identification by PCR

Vaccination policy

Don't exist

Results of the investigation

Number of slaughter batches tested: 230
Number of slaughter batches positive: 164
Slaughter batch prevalence: 71% Campylobacter spp. (95% CI: 65.20;76.87)

National evaluation of the recent situation, the trends and sources of infection

More studies need to be developed

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

More studies need to be developed

C. thermophilic Campylobacter spp., unspecified in animal - Cattle (bovine animals)

Monitoring system

Sampling strategy

Sampling have been performed in 8 slaughterhouses placed in different regions of Spain and representatives of the total volume of sacrifice of the country.
Samples have been taken from june to november

Frequency of the sampling

Two faecal samples has been taken in all the slaughter batches in the day of sampling, with a maximun of 50 batches. Each batch belonged to different holdings.
Sampling has been performed in 8 slaughterhouses placed in Madrid, Barcelona, Murcia, Huesca, Lérida, Cáceres and Ciudad Real. These slaughterhouses have a high volume of activity, representing an important part of all the bovines sacrified in Spain.
A total of 326 samples have been taken, belonging to 163 slaughter batches and 163 different holdings.
Faeces were taken from the colon, refrigerated inmediatly and sent to the laboratory and analyzed before 24 hours.

Type of specimen taken

Faeces

Case definition

One slaughter batch was considered as positive if isolation of Campylobacter spp. by culture

and identification by PCR

Diagnostic/ analytical methods used

Isolation in agar CCDA and PCR

Results of the investigation

Number of slaughter batches analyzed: 163
Number of slaughter batches positive: 75
Slaughter batch prevalence: 46% (95% IC: 38.46;53.70)

Table Campylobacter in animals

	Source of information	Sampling unit	Units tested	Total units positive for thermophilic Campylobacter spp.	C. jejuni	C. coli	C. lari	C. upsaliensis	Thermophilic Campylobacter spp., unspecified
Cattle (bovine animals)									
meat production animals	A	slaughter batch	163	75	61	14			
Pigs	A	slaughter batch	230	164		146			18
Gallus gallus (fowl)									
broilers									
- at slaughterhouse	A	slaughter batch	89	41	20	21			

Footnote

A: Ministry of Environment and Rural and Marine Affairs. National Survey.

2.2.4. Antimicrobial resistance in Campylobacter isolates

A. Antimicrobial resistance in Campylobacter jejuni and coli in cattle

Sampling strategy used in monitoring

Frequency of the sampling

see text form on thermophilic Campylobacter spp. in cattle

Type of specimen taken

see text form on thermophilic Campylobacter spp. in cattle

Methods of sampling (description of sampling techniques)

see text form on thermophilic Campylobacter spp. in cattle

Procedures for the selection of isolates for antimicrobial testing

all the isolates of the national survey

Methods used for collecting data

National survey

Laboratory methodology used for identification of the microbial isolates

see text form on thermophilic Campylobacter spp. in cattle

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see table

Breakpoints used in testing

see table

Results of the investigation

see table of results

B. Antimicrobial resistance in Campylobacter jejuni and coli in pigs

Sampling strategy used in monitoring

Frequency of the sampling

see text form on thermophilic Campylobacter in pigs

Type of specimen taken

see text form on thermophilic Campylobacter in pigs

Methods of sampling (description of sampling techniques)

see text form on thermophilic Campylobacter in pigs

Procedures for the selection of isolates for antimicrobial testing

all isolates of national survey

Methods used for collecting data

National survey

Laboratory methodology used for identification of the microbial isolates

see text form on thermophilic Campylobacter in pigs

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see tables of results

Breakpoints used in testing

see table of breakpoints

Results of the investigation

see tables of results

C. Antimicrobial resistance in Campylobacter jejuni and coli in poultry

Sampling strategy used in monitoring

Frequency of the sampling

see text form on thermophilic Campylobacter in Gallus gallus

Type of specimen taken

see text form on thermophilic Campylobacter in Gallus gallus

Methods of sampling (description of sampling techniques)

see text form on thermophilic Campylobacter in Gallus gallus

Procedures for the selection of isolates for antimicrobial testing

all isolates of National survey

Methods used for collecting data

National survey

Laboratory methodology used for identification of the microbial isolates

see text form on thermophilic Campylobacter in Gallus gallus

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see tables of results

Breakpoints used in testing

see table of breakpoints

Results of the investigation

see tables of results

Table Antimicrobial susceptibility testing of C. coli in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	C. coli
	Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	144

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	144	23				3	3	54	61	5		1		5	12							
Neomycin	8	144	43				1			6	45	49	4	1	3	35							
Streptomycin	4	144	129							3	12	5		1	19	104							
Amphenicols																							
Chloramphenicol	16	144	0							103	39	2											
Florfenicol	16	144	0								144												
Fluoroquinolones																							
Ciprofloxacin	1	144	126		3	10	3	2			12	43	55	15	1								
Macrolides																							
Erythromycin	16	144	90				4	10	24	12	2	2		2	88								
Penicillins																							
Amoxicillin	16	144	68						22	13	7	12	22	3	2	13	36	14					
Quinolones																							
Nalidixic acid	16	144	127								1	10	6	5	35	73	14						
Tetracyclines																							
Tetracyclin	2	144	142					2				3	6	9	40	59	24	1					

Table Antimicrobial susceptibility testing of C. coli in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	C. coli
	Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	21

Antimicrobials:				Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																													
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																	
Kanamycin	14	21	5	5													1		1	3		4	4	3									
Macrolides																																	
Tylosine	12	21	2				2										1									1	2	4		3	2		6
Polymyxins																																	
Colistin	14	21	1	1														1	1		1	1	3	4	6	1	1	1					
Sulfonamides																																	
Sulfonamide	12	21	7	7										1		1		1				1	1	1	1	2	1		1	1			2

Table Antimicrobial susceptibility testing in C. coli

n = Number of resistant isolates	C. coli					
	Gallus gallus (fowl)		**Cattle (bovine animals)**		**Pigs**	
Isolates out of a monitoring programme	yes		yes		yes	
Number of isolates available in the laboratory	21		14		144	
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides						
Gentamicin	21	1	14	2	144	23
Kanamycin	21	5	14	2	144	47
Neomycin	21	4	14	3	144	43
Streptomycin	21	7	14	10	144	129
Amphenicols						
Chloramphenicol	21	0	14	0	144	0
Florfenicol	21	0	14	0	144	0
Fluoroquinolones						
Ciprofloxacin	21	21	14	12	144	126
Macrolides						
Erythromycin	21	2	14	1	144	90
Tylosine	21	2	14	1	144	87
Penicillins						
Amoxicillin	21	11	14	3	144	68
Polymyxins						
Colistin	21	1	14	0	144	7
Quinolones						
Nalidixic acid	21	21	14	12	144	127
Sulfonamides						
Sulfonamide	21	0	14	0	144	0
Tetracyclines						
Tetracyclin	21	19	14	13	144	142

Table Antimicrobial susceptibility testing of C. coli in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	C. coli
	Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	21

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	21	1					7	12	1						1							
Neomycin	8	21	4							9	7	1				4							
Streptomycin	4	21	7							12	2			2	2	3							
Amphenicols																							
Chloramphenicol	16	21	0							18	2	1											
Florfenicol	16	21	0								21												
Fluoroquinolones																							
Ciprofloxacin	1	21	21							1	4	8	7		1								
Macrolides																							
Erythromycin	16	21	2				5	6	5	2	1				2								
Penicillins																							
Amoxicillin	16	21	11						3	2		2	3	2		2	4	3					
Quinolones																							
Nalidixic acid	16	21	21											3	11	6	1						
Tetracyclines																							
Tetracyclin	2	21	19					2				1	1	2	7	7	1						

Table Antimicrobial susceptibility testing of C. coli in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	C. coli
	Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	144

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																	
Kanamycin	14	144	47	43	1						1	2	2	4	5	12	14	18	12	11	6	9	3	1									
Macrolides																																	
Tylosine	12	144	87				84	2		1	1	1					1		3	1		1	6	4	2	2	1	12	5	7	1	1	8
Polymyxins																																	
Colistin	14	144	7	2							2	3	8	4	1	3	4	12	13	7	15	21	23	13	8	2	2	1					
Sulfonamides																																	
Sulfonamide	12	52	2				2				2	2	1	3	3	3	1			2	5	5	4	4	2	1	2	7			1	2	

Table Antimicrobial susceptibility testing of C. coli in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	C. coli
	Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	14

Antimicrobials:	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																															
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																	
Kanamycin	14	14	2	2												1	1	7	2		1												
Macrolides																																	
Tylosine	12	14	1				1														1		2	2	2	1	1	3	1				
Polymyxins																																	
Colistin	14	14	0													1	1	1		2	5	3		1									
Sulfonamides																																	
Sulfonamide	12	14	8	8											1			1	2	1	1												

Table Antimicrobial susceptibility testing of C. coli in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	C. coli
	Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	14

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	14	2						10	2						2							
Neomycin	8	14	3								8	3	1			2							
Streptomycin	4	14	10							3	1				4	6							
Amphenicols																							
Chloramphenicol	16	14	0							6	6	2											
Florfenicol	16	14	0								14												
Fluoroquinolones																							
Ciprofloxacin	1	14	12			2						5	5	2									
Macrolides																							
Erythromycin	16	14	1						10	3					1								
Penicillins																							
Amoxicillin	16	14	3							3	1	2	5				2	1					
Quinolones																							
Nalidixic acid	16	14	12									2			2	9	1						
Tetracyclines																							
Tetracyclin	2	14	13					1					1	1	2	9							

Table Antimicrobial susceptibility testing of C. jejuni in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	C. jejuni Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	55

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	55	0				24	25	5	1													
Neomycin	8	55	6					3	12	28	5	1	1	3		2							
Streptomycin	4	55	2							52	1			1	1								
Amphenicols																							
Chloramphenicol	16	55	0							53	2												
Florfenicol	16	55	0								55												
Fluoroquinolones																							
Ciprofloxacin	1	55	26		17	9	3				4	15	5	1	1								
Macrolides																							
Erythromycin	16	55	0				44	8	2	1													
Penicillins																							
Amoxicillin	16	55	9						9	4	13	9	11	1		5	2	1					
Quinolones																							
Nalidixic acid	16	55	26								15	12	2	1	8	13	4						
Tetracyclines																							
Tetracyclin	2	55	44					10		1		1	6	16	9	6	6						

Table Antimicrobial susceptibility testing in C. jejuni

n = Number of resistant isolates				
	C. jejuni			
	Gallus gallus (fowl)		**Cattle (bovine animals)**	
Isolates out of a monitoring programme	yes		yes	
Number of isolates available in the laboratory	19		55	
Antimicrobials:	**N**	**n**	**N**	**n**
Aminoglycosides				
Gentamicin	19	2	55	1
Kanamycin	19	1	55	6
Neomycin	19	1	55	6
Streptomycin	19	7	55	2
Amphenicols				
Chloramphenicol	19	0	55	0
Florfenicol	19	0	55	0
Fluoroquinolones				
Ciprofloxacin	19	19	55	26
Macrolides				
Erythromycin	19	1	55	0
Tylosine	19	0	55	0
Penicillins				
Amoxicillin	19	7	55	9
Polymyxins				
Colistin	19	0	55	0
Quinolones				
Nalidixic acid	19	19	55	26
Sulfonamides				
Sulfonamide	19	0	55	0
Tetracyclines				
Tetracyclin	19	17	55	44

Table Antimicrobial susceptibility testing of C. jejuni in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	C. jejuni
	Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	19

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	19	1				8	5	4	1						1							
Neomycin	8	19	1					1	8	4	4	1		1									
Streptomycin	2	19	7							12	2			2	1	2							
Amphenicols																							
Chloramphenicol	16	19	0							14	5												
Florfenicol	16	19	0								19												
Fluoroquinolones																							
Ciprofloxacin	1	19	19								1	11	6		1								
Macrolides																							
Erythromycin	16	19	1				10	6	1	1					1								
Penicillins																							
Amoxicillin	16	19	7						3	2	1	2	4	1	2		3	1					
Quinolones																							
Nalidixic acid	16	19	19											1	3	10	5						
Tetracyclines																							
Tetracyclin	2	19	17					2				2	2	4	1	6	2						

Table Antimicrobial susceptibility testing of C. jejuni in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	C. jejuni
	Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	55

Antimicrobials:			**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																															
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																		
Kanamycin	14	55	6	6													1	1	1	2	2	12	14	6	3	3		3		1				
Macrolides																																		
Tylosine	12	55	0																					1	2	3		14	5	7	4	4	15
Polymyxins																																		
Colistin	14	55	0											1	1	4	1	9	2	8	3	13	5	4	2	1		1						
Sulfonamides																																		
Sulfonamide	12	55	2	1			1					1	1	1				3	2	3	4	9	4	8	3	7	1	2	1	2		1		

Table Antimicrobial susceptibility testing of C. jejuni in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	C. jejuni
	Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	19

Antimicrobials:				Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																												
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																	
Kanamycin	14	19	1	1										1	1			1		1	1	1	3	1		4		2		1			1
Macrolides																																	
Tylosine	12	19	0																					1		2		1	3	1	1	1	9
Polymyxins																																	
Colistin	14	19	0												1	1	1	1	2	2	2		4	3	1	1							
Sulfonamides																																	
Sulfonamide	12	19	2	2								1				2		1		1	2	1		3	2			1		2			1

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

Disc diffusion

Broth dilution

Standards used for testing

EFSA_J

Campylobacter	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol	VAV			16	2	256				
Florfenicol	VAV			16	4	128				
Tetracyclines										
Tetracyclin	EFSAJ			2	0.5	256				
Fluoroquinolones										
Ciprofloxacin	EFSA J			1	0.06	32				
Quinolones										
Nalidixic acid	VAV			16	0.5	128				
Sulfonamides										
Sulfonamide	VAV						300			12
Aminoglycosides										
Streptomycin	VAV			4	2	64				
Gentamicin (1)	EFSA J			2	0.25	32				
Neomycin	VAV			8	0.25	64				
Kanamycin	VAV						30			14
Macrolides										
Erythromycin (2)	EFSA J			16	0.25	32				
Tylosine (3)	VAV						150			12
Penicillins										
Amoxicillin	VAV			16	1	256				
Ampicillin										
Polymyxins										
Colistin	VAV						50			14

(1) : Breakpoints, >1 for C. jejuni and >2 for C. coli
(2) : Breakpoints, >4 for C. jejuni and >16 for C. coli
(3) : Rosco tablets

2.3. LISTERIOSIS

2.3.1. General evaluation of the national situation

A. Listeriosis general evaluation

History of the disease and/ or infection in the country

Listeria monocytogenes has been recognised as a human pathogen for more than 50 years. It causes invasive illness mainly in certain well defined high-risk groups, including immunocompromised persons, pregnant women and neonates. However listeriosis can occur in otherwise healthy individuals, particularly in the setting of an outbreak. The public health importance of listeriosis is not always recognised particularly because listeriosis is a relatively rare disease compared to other common food-borne illnesses such as salmonellosis. Also listeriosis is a disease that clinically affects cattle, but mainly ewes in Spain.

Recent actions taken to control the zoonoses

The activities are made according to Regulation (EC) nº 178/ 2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs). must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures….
Sampling is distributed evenly throughout the year.

Additional information

Diagnostic methods used in food : Bacteriological method: ISO 11290-2_:2004.

2.3.2. Listeria in foodstuffs

Table Listeria monocytogenes in milk and dairy products

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/ g	L. monocytogenes > 100 cfu/ g
Dairy products (excluding cheeses)										
ice-cream	F	single	25g	533	1	511	1	22	0	0
dairy products, not specified										
ready-to-eat	F	single	25g	1154	32	1029	29	125	3	0
Cheeses, made from unspecified milk or other animal milk	F	single	25g	102	0	102	0			

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

Table Listeria monocytogenes in other foods

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for L.monocytogenes	Units tested with detection method	Listeria monocytogenes presence in x g	Units tested with enumeration method	> detection limit but <= 100 cfu/ g	L. monocytogenes > 100 cfu/ g
Meat from broilers (Gallus gallus)										
fresh	F	single	25g	23	3	19	0	4	3	0
meat products										
cooked, ready-to-eat										
- at retail	F	single	25g	76	7	31	2	45	5	0
Meat from pig										
fresh	F	single	25g	53	2	53	2			
meat products										
cooked, ready-to-eat										
- at retail	F	single	25g	766	39	418	17	348	19	3
Meat from bovine animals										
fresh	F	single	25g	6	1	6	1			
meat products										
cooked, ready-to-eat										
- at retail	F	single	25g	14	0	14	0			
Meat from other animal species or not specified										
fresh	F	single	25g	53	6	53	6			
meat products										
cooked, ready-to-eat										
- at retail	F	single	25g	25	1	25	1			
Meat, mixed meat										
minced meat	F	single	25g	437	67	320	18	117	32	17
Fishery products, unspecified										
ready-to-eat	F	single	25g	669	36	653	34	16	0	2
Egg products	F	single	25g	85	2	85	2			
Vegetables										
pre-cut										
ready-to-eat	F	single	25g	68	1	60	0	8	0	1
Other processed food products and prepared dishes	F	single	25g	6261	57	4992	29	1269	16	12
Other food	F	single	25g	602	4	561	3	41	1	

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

2.3.3. Listeria in animals

Table Listeria in animals

	Source of information	Sampling unit	Units tested	Total units positive for Listeria spp.	L. monocytogenes	Listeria spp., unspecified
Cattle (bovine animals)						
dairy cows	A	animal	68311	20		20
Sheep	A	animal	10	1		1

Footnote

A: Official Laboratory of Autonomous Community of Galicia.

2.4. E. COLI INFECTIONS

2.4.1. General evaluation of the national situation

A. Verotoxigenic Escherichia coli infections general evaluation

History of the disease and/ or infection in the country

Verotoxigenic Escherichia coli have emerged as foodborne pathogens which can cause severe and potencially fatal illness.Rumiants,specially cattle and sheep, have been implicated as the principal reservoir of VTEC.Transmission happened through consumption of undercooked meat, unpasteurized dairy products, vegetables or water contaminated by rumiant faeces.
Studies about VTEC in Spain was firstly developed by Laboratory of E. coli of Veterinary University of Lugo.
Between 1980 and 1995, 90% of cattle farms tested in region of Galicia were positive to VTEC, with 26% of animals coloniozed by VTEC no-O157 and 0,9% colonized by ECVT O157:H7. In 1999, 20% of farms and 10% of animals were colonized by ECVT O157:H7.In 1998, 15% of calves tested of others regions of Spain were carrier of ECVT O157:H7.
In sheeps,36% of lambs of region of Extremadura tested in 1997 were carrier of ECVT, but only 0,4% were colonized by strain O157:H7.Similar results have been obtained in studies carried out between 2000 and 2001.
In 2007. a national survey has been performed in cattle for meat production at slaughterhouse under a herd based approach.

National evaluation of the recent situation, the trends and sources of infection

In cattle, the percentage of animals colonized by strain O157:H7 has been lower in last sueveys.Raw beef products are the main source of infection.
Small rumiants may also represent a source of transmision of VTEC to humans.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

The high percentage of animals colonized by strain O157:H7 in last years agree with growing of human incidence, but outbreaks of the disease are lower at the moment.

Recent actions taken to control the zoonoses

Surveillance of the disease according to Directive 2003/ 99/ EEC. National survey 2007 in cattle for meat production.
Compulsory and voluntary monitoring programmes in raw meat of diferent species of animals, minced meat and meat products, other animal origin products, vegetables and others products.

Additional information

Diagnostic methods used in food:
- Bacteriological method: ISO 16654:2001.
- Method ELISA
- PCR-Bax

2.4.2. Escherichia coli, pathogenic in foodstuffs

Table VT E. coli in food

	Source of information	Sampling unit	Sample weight	Units tested	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC non-O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified
Meat from broilers (Gallus gallus)								
fresh								
- at slaughterhouse	F	single	25g	5	0			
- at retail	F	single	25g	7	0			
- at cutting plant	F	single	25g	11	0			
meat products								
- at retail	F	single	25g	3	0			
Meat from pig								
fresh								
- at slaughterhouse	F	single	25g	21	0			
- at retail	F	single	25g	17	0			
- at cutting plant	F	single	25g	55	0			
meat products								
- at retail	F	single	25g	14	0			
Meat from bovine animals								
fresh								
- at slaughterhouse	F	single	25g	57	1	1		
- at retail	F	single	25g	69	1			1
- at cutting plant	F	single	25g	144	0			
meat products								
- at processing plant	F	single	25g	2	0			
- at retail	F	single	25g	7	0			
Meat from sheep								
fresh								
- at slaughterhouse	F	single	25g	83	0			

- at retail	F	single	25g	10	0			
- at cutting plant	F	single	25g	7	0			
Milk, cows'								
raw	F	single	25g	8	0			
UHT milk	F	single	25g	3	0			
Vegetables	F	single	25g	54	0			
Meat from poultry, unspecified								
fresh								
- at slaughterhouse	F	single	25g	9	0			
- at retail	F	single	25g	50	0			
Meat from goat								
fresh								
- at slaughterhouse	F	single	25g	3	0			
- at retail	F	single	25g	6	0			
- at cutting plant	F	single	25g	4	0			
Meat, mixed meat								
minced meat	F	single	25g	903	3	1		2
Dairy products (excluding cheeses)	F	single	25g	233	0			
Cheeses, made from unspecified milk or other animal milk	F	single	25g	6	1			1
Fishery products, unspecified	F	single	25g	347	0			
Other processed food products and prepared dishes	F	single	25g	840	1			1
Other food	F	single	25g	143	0			0

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES

2.4.3. Escherichia coli, pathogenic in animals

A. Verotoxigenic Escherichia coli in cattle (bovine animals)

Monitoring system

Sampling strategy

Sampling have been performed in 8 slaughterhouses placed in different regions of Spain and representative of the total volume of sacrifice of the country

Frequency of the sampling

Animals at slaughter (herd based approach)

Sampling takes place during the months between june and november

Type of specimen taken

Animals at slaughter (herd based approach)

Faeces

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

Two faecal samples at colon level have been taken in all the slaughter batches in the day of sampling, with a maximun of 50 batches. Each batch belonged to different holdings.
Sampling has been performed in 8 slaughterhouses placed in Madrid, Barcelona, Murcia, Huesca, Lérida, Cáceres and Ciudad Real. These slaughterhouses have a high volume of activity, representing an important part of all the bovines sacrified in Spain.
A total of 312 samples have been taken, belonging to 156 slaughter batches and 163 different holdings.
Faeces were taken from the colon, refrigerated inmediatly and sent to the laboratory and analyzed before 24 hours.

Case definition

Animals at slaughter (herd based approach)

isolation of VTEC and PCR/ IMS

Diagnostic/ analytical methods used

Animals at slaughter (herd based approach)

Bacteriological method: ISO 16654:2001

Vaccination policy

In Spain a vaccination policy does not exist.
At farm, vaccines can be used by private veterinarians to control neonatal septicemia in calves.

Control program/ mechanisms

The control program/ strategies in place

Don´t exist

Recent actions taken to control the zoonoses

National survey in cattle at slaughterhouse

Results of the investigation

Number os slaughter batches tested: 156
Mumber of slaughter batches positive: 53
Slaugter batch (herd) prevalence: 34% (95% CI: 26,6;41,9)

National evaluation of the recent situation, the trends and sources of infection

Described in General Evaluation

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Described in General Evaluation

Table VT E. coli in animals

	Source of information	Sampling unit	Sample weight	Units tested	Verotoxigenic E. coli (VTEC)	Verotoxigenic E. coli (VTEC) - VTEC O157	Verotoxigenic E. coli (VTEC) - VTEC non-O157	Verotoxigenic E. coli (VTEC) - VTEC, unspecified
Cattle (bovine animals)								
meat production animals								
- at slaughterhouse	A	slaughter batch	25 grs	156	53	53		

Footnote

A: Ministry of Environment and Rural and Marine Affairs. National survey.

2.5. TUBERCULOSIS, MYCOBACTERIAL DISEASES

2.5.1. General evaluation of the national situation

A. Tuberculosis general evaluation

History of the disease and/ or infection in the country

Sanitary importance of bovine tuberculosis has been based in the spread of the disease to humans. Human infection has been linked historically to raw milk consumption. At human level the surveillance of the disease is included in National Net of Epidemiological Surveillance, according with Royal Decree 2210/ 1995, december 25, by Epidemiological Surveillance National Net is created.
In Spain, control of milk was carried out at council town's level since 1908, but monitoring and eradication programmes in cattle didn't start systematically until begining of 90's, focused mainly in dairy cows. At the moment the programme is being applied to cattle over six weeks of age,and to goats living close to cattle, according to Directive 64/ 432/ EEC.
Control of milk and control of fresh meat production is carried out by Autonomous Communities according to European legislation in force (hygiene package).

National evaluation of the recent situation, the trends and sources of infection

Spanish programmes for eradication on bovine tuberculosis in last years show the continous decrease of the disease prevalence in cattle. In 2007 herd prevalence was 1.68%(2.14% in 2003, 1.80% in 2004, 1,54% in 2005 and 1.76 in 2006), with 97.20% of herds qualified as officially free(95.77% in 2003, 96,56% in 2004, 97.34% in 2005 and 96.94% in 2006). Animal prevalence in 2007 was 0.49%(0.47% in 2003, 0.40% in 2004, 0.31% in 2005 and 0.42% in 2006).Raw milk only can be consumed if produced in herds OTF.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Only few human cases had been identify as tuberculosis by Mycobacterium bovis in the last years. The risk of transmission from animals to humans is very low.

Recent actions taken to control the zoonoses

Spanish Programme on Eradication of Bovine Tuberculosis 2007.
Milk control and fresh meat control production are developed according to european legislation in force (Hygiene Package).

Additional information

M. caprae has been isolated in 2005-2007 from cattle, goats, wild boards,foxes, wild ruminants.

2.5.2. Mycobacterium in animals

A. Mycobacterium bovis in bovine animals

Monitoring system

Sampling strategy

Sampling strategy is defined in Spanish Programme on Eradication of Bovine Tuberculosis, covering cattle according Directive 64/ 432/ EEC(animals over six weeks of age)and goats living close to cattle. Testing is performed under supervision of competent authorities of Autonomous Comunities.At slaughterhouses samples are taken in suspicius animals and in animals with suspicius injures.Strategic use on gamma-interferon assay has been implemented in 2007 and consequently, an increase in the sensivity at animal level (intra-herd) has been applied. Around 70.000 gamma-interferón tests have been performed in 2007.
Additionally, severe interpretation of skin test(SIT)has been applied in high prevelence areas, with 2 skin tests in OTF herds and at least 3 skin tests in non-OTF herds during 2007. These measures have increased the sensitivity at herd level as well.
More than 140.000 pre-movemment tests have been performed in 2007.

Frequency of the sampling

Once a year at least, more frequent testing in not officially free herds (at least 3 tests)and in OTF herds in high prevalence areas (2 at least).
Pre-movemment test in movemments except if animals go to a closed fattening unit that exclusively send animals to a slaughterhouse.

Type of specimen taken

Other: skin test, blood, organs/ tissues

Methods of sampling (description of sampling techniques)

In herds intradermal skin test (SIT) is used in animals over 6 weeks of age. In infected herds, gamma interferon assay is used in parallel as supplementary test in animals over six mounths of age. In low prevalence areas, SICCT can be used if specificity problems are detected.
At slaughterhouses organs/ tissues are taken from suspicius animals (mainly from herds with OTF status suspended)and from injures found in routine post-mortem examination of animals slaughtered, according to the European legislation in force (Hygiene Package).

Case definition

skin test: positive and inconclusive results. In OTF herds also M. bovis isolation.
Gamma-interferon: positive results, cut-off value 0,05.
Organs/ tissues:compatible lesions,auramine+, isolation or positive PCR

Diagnostic/ analytical methods used

SIT, SICCT, agent isolation, PCR and gamma-interferon assay following criteria laying down by Annex B of Directive 64/ 432/ EEC

Vaccination policy

Forbidden

Other preventive measures than vaccination in place

Premovemment test; Cleaning and disinfecting of positive holdings; Control of common grazing areas; Investigation of wildlife in some regions; Epidemiological investigations in breakdowns; inspections and oficial control of the field veterinarians.

Control program/ mechanisms

The control program/ strategies in place

Spain has an Eradication Programme aproved for co-financing according to Decision 2006/ 875/ EEC and Decision 90/ 424/ EEC
Legal basis of the programme measures is Council Directive 64/ 432/ EEC,but with increased measures like:
- more frecuent tests in high prevalence areas
- strategic use of gamma-interferon assay
- pre-movemment test
- severe interpretation of SIT

Recent actions taken to control the zoonoses

More frequent testing and pre-movement test
Compulsory slaughtering of all animals in herds with high incidence or repeating positive results
Severe interpretation of tuberculin test
Research into other test methodologies
Reinforce over herd registers at farm level
Epidemiological studies
Surveillance of wildlife
Inspections in restricted herds
Inspection of field veterinarians

Suggestions to the Community for the actions to be taken

Research into other test methodologies and improve the existing ones.

Measures in case of the positive findings or single cases

Confirmation by isolation/ PCR of M. bovis. If confirmed, withdrawal of OTF status by holding. Epidemiological studies, spoligotyping of the strain and inclusion in the National Database micoDB.es.

Notification system in place

Since 1952, at least (Epizootic Diseases Law)<br/ >At the moment by Animal Health Law 8/ 2003

Results of the investigation

Herd prevalence: 1,63%
Animal prevalence: 0,49%
Herd incidence: 1,02%
Status of herds: 97,20% OTF

National evaluation of the recent situation, the trends and sources of infection

Data obtained by applying of Spanish Tuberculosis Eradication and Monitoring Programme show a moderate decrease of the disease in the country,following the trends of last years.
Disease is close to eradication in dairy herds (0.68% of herd prevalence in 2007).In conclusion, milk consumption can´t be considered as a current source of infection in Spain,even more if it is assumed that cow milk is thermally treated.
In herds for meat production, herd prevalence is 1,90%. Explanation of this higher prevalence can be found in special managemment of this kind of herds: common grazing, ranching systems, fighting bulls, trashumance... Wildlife and goats can also be a source of infection in these holdings. Spain is suffering a long drought period that incrase the contact between all animal species in common points(water, feed).
The increase in the diagnostic sensitivity in 2007 has important influence in the herd prevalence and incidence, that are higher than other programmes that use less sensitivity diagnostic strategies. Then, comparations between programmes with different diagnostic strategies have to be carefully explained and interpreted.

Table Tuberculosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Mycobacterium spp.	M. bovis	M. tuberculosis	Mycobacterium spp., unspecified
Goats	B	animal	3560	889			889
Pigs	B	animal	218	28	28		
Deer							
wild							
roe deer							
- from hunting - Survey	A	animal	8	4			4
red deer							
- in total - Surveillance	A	animal	670	45			45
fallow deer							
- in total - Surveillance	A	animal	20	3			3
Wild boars							
wild							
- in total - Surveillance	A	animal	836	141			141

Footnote

A: SURVEILLANCE PROGRAMMES OF MINISTRY OF ENVIRONMENT AND RURAL AND MARINE AFFAIRS AND AUTONOMOUS COMMUNITIES
B: ANIMAL HEALTH SERVICES OF CATALUÑA, CASTILLA Y LEON AND MADRID

Table Bovine tuberculosis - data on herds - Community co-financed eradication programmes

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds - period herd prevalence	% new positive herds - herd incidence
Valencia	705	679	612	7	7	1	14.286	90.133	1.144	1.144
Castilla-La Mancha	3479	2219	2219	211	123	23	10.9	100	9.509	5.543
La Rioja	346	284	284	2	2	0	0	100	0.704	0.704
Madrid	1746	1524	1524	52	40	4	7.692	100	3.412	2.625
Cataluña	6253	4533	4462	48	23	12	25	98.434	1.076	0.515
Asturias	21167	20890	20890	51	47	13	25.49	100	0.244	0.225
Andalucía	9655	8657	7372	306	195	1	0.327	85.157	4.151	2.645
Aragón	3450	2072	1095	40	32	1	2.5	52.847	3.653	2.922
Baleares	580	473	463	1	0	1	100	97.886	0.216	0
Canarias	1359	1359	1359	5	5	2	40	100	0.368	0.368
Cantabria	8654	8631	8631	194	157	34	17.526	100	2.248	1.819
Castilla y León	25250	16640	16640	693	557	26	3.752	100	4.165	3.347
País Vasco	27195	6458	5859	11	9	4	36.364	90.725	0.188	0.154
Murcia	396	385	385	33	29	0	0	100	8.571	7.532
Navarra	1959	1820	1807	6	5	2	33.333	99.286	0.332	0.277
Galicia	57467	46482	46482	88	30	32	36.364	100	0.189	0.065
Extremadura	12245	10188	9979	373	68	11	2.949	97.949	3.738	0.681
Total	181906	133294	130063	2121	1329	167	7.874	97.576	1.631	1.022
Total - 1	165438	141710	136922	2408	1155	141	5.855	96.621	1.759	0.844

Table Bovine tuberculosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Valencia	58948	45729	45729	45729	203	203	267	100	0.444
Castilla-La Mancha	403248	253845	253845	253845	6586	6586	8845	100	2.594
La Rioja	38838	25716	25716	25716	95	95	95	100	0.369
Madrid	121589	113808	113808	113808	719	719	803	100	0.632
Asturias	378840	365291	365291	365291	220	220	648	100	0.06
Cataluña	641088	316182	305679	305679	735	1188	552	96.678	0.24
Andalucía	626293	555999	506805	506805	3205	3205	3306	91.152	0.632
Aragón	262181	72973	72973	72973	460	460	474	100	0.63
Baleares	35379	26219	24028	24028	0	0	110	91.643	0
Canarias	18896	18896	18896	18896	8	8	115	100	0.042
Cantabria	283767	276616	276616	276616	1893	1893	3106	100	0.684
Castilla y León	1308645	1003706	1003706	1003706	4853	4733	6212	100	0.484
País Vasco	89420	73053	73053	73053	74	74	260	100	0.101
Navarra	114254	95827	85324	85324	116	116	125	89.04	0.136
Murcia	70435	49654	49654	49654	133	95	95	100	0.268
Galicia	945033	747516	747516	747516	311	311	1172	100	0.042
Extremadura	999709	781683	685432	685432	3161	2910	3619	87.687	0.461
Total	6396563	4822713	4654071	4654071	22772	22816	29804	96.503	0.489
Total - 1	6225198	4736555	4591504	4589314	19194	18782	24485	96.938	0.418

Table Bovine tuberculosis - data on status of herds at the end of the period - Community co-financed eradication programmes

Region	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Murcia	385	46494	0	0	7	883	12	471	8	1941	0	0	358	43199
Navarra	1826	95577	0	0	2	630	2	214	26	2739	0	0	1796	91994
Aragón	1094	72976	0	0	5	780	0	0	24	3202	0	0	1065	68994
Galicia	46482	747516	0	0	2	407	68	1501	15	522	0	0	46397	745086
Extremadura	9921	1020185	0	0	132	36570	563	69019	107	12757	0	0	9119	901839
Andalucía	7897	555999	209	4816	165	20301	615	33760	0	0	0	0	6908	497122
Castilla-La Mancha	2207	246389	11	813	147	26150	91	9233	25	2022	0	0	1933	208171
Valencia	679	58954	5	25	2	108	28	408	1	18	0	0	640	58395
La Rioja	284	25716	0	0	0	0	1	123	0	0	0	0	283	25593
Madrid	1524	113808	7	191	30	369	22	352	0	0	0	0	1465	112896
Cataluña	4533	452915	9	163	26	2794	36	3240	79	6537	0	0	4383	440681
Asturias	20890	365291	0	0	17	682	34	1394	32	1158	0	0	20807	362057
Castilla y León	16640	1003706	81	1962	171	28308	334	40454	125	9878	0	0	15929	923104
Cantabria	8631	276616	0	0	64	3347	93	5881	0	0	0	0	8474	267388
Baleares	473	26219	3	126	0	0	43	718	7	87	0	0	420	25288
Canarias	1359	18896	0	0	0	0	0	0	4	282	0	0	1355	18614
País Vasco	4062	67328	0	0	1	1	793	32149	1	2	0	0	4061	67327
Total	128887	5194585	325	8096	771	121330	2735	198917	454	41145	0	0	125393	4857748
Total - 1	141510	4745060	260	8937	763	97069	2465	197349	537	35466	0	0	137184	4398506

2.6. BRUCELLOSIS

2.6.1. General evaluation of the national situation

A. Brucellosis general evaluation

History of the disease and/ or infection in the country

Sanitary importance of brucellosis has been based in the spread of the disease to humans.At the moment brucellosis is still the main direct transmission zoonoses in the world, and in Spain as well, mainly linked to Brucella melitensis.The more frecuent source of infection for human beins have been contacts with goats and sheeps, but raw milk products consumption have had historical importance as well.Nowadays brucellosis is considered as a proffesional disease.
In Spain, milk control was carried out at council town's level since 1908. At the moment milk control and control of fresh meat production is carried out by Autonomous Communities according to the european legislation in force (Hygiene Package).
Monitoring and Eradication Programmes in cattle, goats and sheep didn't start systematically until beginig of 90's.Before, human cases had the higest incidence in last thirty years, with arround 8500 cases in middle 80´s.The sistematic application of national programmes has resulted in a continous decrease of the disease in humans.At the moment the Programmes are being applied according to Directive 64/ 432/ EEC and Directive 91/ 68/ EEC.
At human level disease brucellosis is a mandatory notifiable disease since 1943. It is included in National Network of Epidemiology Surveillance, (Royal Decree 2210/ 1995, december 25), by Epidemiological Surveillance National Net is created.

National evaluation of the recent situation, the trends and sources of infection

Spanish Programmes for eradication and monitoring of Brucellosis in cattle, goats and sheeps show the continous decreasing, in general, of the disease prevalence in domestic animals. In 2007 herd prevalence was 0.57%(1.45% in 2003; 1.54% in 2004; 1.25% in 2005;0,84 in 2006)in cattle and 2.79%(5.58% in 2003; 5.12% in 2004; 4.43% in 2005; 3.20 in 2006) in goats and sheep.Animal prevalence was 0.13%(0.45% in 2003; 0,59% in 2004; 0.37% in 2005;0.22% in 2006)in cattle and 0.25%(0.87% in 2003; 0,62% in 2004; 0.45% in 2005; 0,34% in 2006) in goats and sheep.
Raw milk only can be consumed if produced in herds free or officially free.

Recent actions taken to control the zoonoses

Spanish Programme on eradication of bovine brucellosis 2007.
Spanish Programme for eradication of brucellosis in goats and sheep 2007
Milk control and control of the production of fresh meat in accordance to european legislation in force (Hygiene Package).
Furthermore, the Spanish Royal Decree 640/ 2006, of May 26, 2006, laying down specific implementation conditions of the Community rules concernig hygiene subjets, as well as foodstuff's production and commercialisation, establishes specific conditions regarding to milk and dairy milk.

2.6.2. Brucella in foodstuffs

2.6.3. Brucella in animals

A. Brucella abortus in bovine animals

Monitoring system

Sampling strategy

Sampling strategy is defined in Spanish Programme for Eradication of Bovine Brucellosis, covering cattle acording to Directive 64/ 432/ EEC(animals over 12 mounths of age). Test are carried out by competent authorities of Autonomous Communities.At slaughterhouses samples are taken in suspicius animals, mainly in positive animals coming from free or officially free herds (suspended estatus) to confirm the disease.

Frequency of the sampling

Twice a year at least. Only regions with herd prevalence=0 can apply a reduction of the frequency in herds for milk production following Annex A.II.2 of Council Directive 64/ 432/ CEE.
Pre-movemment test

Type of specimen taken

Other: blood, milk, organs/ tissues,swabs

Methods of sampling (description of sampling techniques)

In animals over one year of age Rose Bengal as screening test or i-ELISA in milk; and Complement Fixation test or i-ELISA in serum as confirmation test.As complementary test competition ELISA has been used as well.
At slaughterhouses swabs, organs and tissues are taken in suspicius animals,mainly from herds with free or oficially free status suspended, to isolate Brucella and confirm the infection.

Case definition

Positive result to Rose Bengal test confirmed by positive result to Complement Fixation or ELISA. In high prevalence areas, positive result to any official test. In free or officially free herds Brucella abortus isolation as well.
Positive result of i-Elisa in milk confirmed by serological methods.

Diagnostic/ analytical methods used

Rose Bengal test ,agent isolation,serum i-ELISA, milk i-ELISA, c-ELISA and Complement Fixation test, following criteria laying down by Annex B of Directive 64/ 432/ EEC

Vaccination policy

Forbiden in general, but in high prevalence areas vaccination can be authorised with vaccine B-19 or

others authorised vaccines(RB-51)according to Directive 64/ 432/ EEC.

Other preventive measures than vaccination in place

Pre-movemment test
Cleaning and disinfecting of positive holdings
Control of common grazing areas
Investigation of possible wildlife reservoirs in some regions
Epidemiological investigations in breakdowns
Inspections and official control of field veterinarians
Inspections of restricted herds.

Control program/ mechanisms

The control program/ strategies in place

Spain has an Eradication and Monitoring Programme approved for co-financing according to Decision 2006/ 875/ EEC.
Legal basis of the programme measures is Directive 64/ 432/ EEC and Royal Decree 2611/ 1996, at last ammended. Inceased measures have been implemented:
pre-movemment test
stamping out in low prevalence areas
vaccination in high prevalence areas
more frequent testing
inspections and official controls of field veterinarians
inspections of restricted herds

Recent actions taken to control the zoonoses

More frecuent testing and pre-movemment test
Compulsory slaughter of all animals in herds with high incidence or repeating positive results, and in low prevalence areas if infection is confirmed
Research into other test methodologies
Reinforce over herd registers at farm level
Epidemiological studies

Suggestions to the Community for the actions to be taken

Research into other test methodologies and improve existing ones, authoritation of new tests (FPA)

Measures in case of the positive findings or single cases

Confirmation of the infection by complement fixation test and culture, and if herd is free or officially free,status is suspended and if isolation of Brucella abortus is confirmed, lost of status by holding and, if the herd is placed in a low plevalence area, depopulation.

Notification system in place

Since 1952, at least(Epizootic Diseases Law)
At the moment by Animal Health Law 8/ 2003

Results of the investigation

Herd prevalence: 0,57%
Animal prevalence: 0,13%
Herd incidence: 0,35%
Herd status: 95,23% OBF; 2,88 BF

National evaluation of the recent situation, the trends and sources of infection

Data obtained by the implementation of Spanish Eradication and Monitoring Programme on Bovine Brucellosis show a moderate increase of the disease in the country in 2004, following by an important decrease in 2005, 2006 and mainly in 2007.
Herd prevalence: 2,30%(2002);1,45%(2003);1,54(2004); 1,25%(2005); 0,84%(2006); 0,57 (2007)
Animal prevalence: 0,39%(2002);0,45%(2003);0,59%(2004); 0,37% (2005); 0,22(2006); 0,13(2007)
Disease is close to eradication in dairy herds.Herd prevalence is below 1%(0,31%).In conclusion, milk consumption can't be considered as a current source of infection in Spain, even more if it is assumed that almost all the cow milk is thermally treated.
In herds for meat production, herd prevalence is below 1% as well (0,64%).

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

Brucellosis in humans is linked in Spain mainly to B. melitensis.

B. Brucella melitensis in sheep

Status as officially free of ovine brucellosis during the reporting year

Free regions

Canary Islands by Decision 2001/ 292/ EC

Monitoring system

Sampling strategy

Sampling strategy is defined in Spanish Programme for eradication and monitoring of brucellosis in sheep and goats, according to Directive 91/ 68/ EEC:
- animals over 6 mounths of age if not vaccined
- animals over 18 mounths of age if vaccined

Tests are carried out by competent authorities of Autonomous Comunities. At slaughterhouse samples are taken in suspicius animals, mainly in positive animals coming from free or oficially free herds(suspended status)to confirm de disease.

Frequency of the sampling

Once a year at least in herd free or officially free
Twice a year at least in non cualificated herds

Type of specimen taken

Other: blood, milk, organs/ tissues

Methods of sampling (description of sampling techniques)

At herd level, in animals over 6 or 18 mounths of age Rose Bengal as screening test and Complement Fixation as confirmatory test.
At slaugterhouses or at holdings, swabs, milk, organs or tissues are taken in suspicius animals, mainly from herds with free or officially free status suspended, to isolate Brucella and confirm the infection.

Case definition

Positive result to Rose Bengal confirmed by positive result to Complement Fixation.
In free or officially free herds Brucella melitensis isolation as well.

Diagnostic/ analytical methods used

Rose Bengal test, agent isolation, Complement Fixation test following criteria laying down by Annex C of Directive 91/ 68/ EEC

Vaccination policy

Animals between 3 and 6 months of age (not in officially free herds or free herds that are on the way to gain oficially free status in low prevalence areas)
In high incidence areas adults can be vaccined exceptionally to control the spread of the disease to other herds or humans.

Other preventive measures than vaccination in place

Pre-movemment test in trashumance in certain areas
Cleaning and desinfecting of positive holdings
Control of common grazing areas
Epidemiological investigations in breakdowns
Inspections and official control of the field veterinarians

Control program/ mechanisms

The control program/ strategies in place

Spain has an Eradication Programme approved for co-financing according to Decision 2005/ 875/ EEC
Legal basis of the programme measures are Directive 91/ 68/ EEC and Royal Decree 1941/ 2004.

Recent actions taken to control the zoonoses

More frecuent testing in non cualificated herds
Compulsory slaughter of all animals in herds with high incidence or repeating positive results
Research in other test methodologies
Reinforce over herd register at farm level
Epidemiological studies

Suggestions to the Community for the actions to be taken

Research into other test methologies ant into other vaccines. Authoritation of new tests (ELISA,FPA)

Measures in case of the positive findings or single cases

Confirmation by complement fixation test, and if herd free or officially free, status is suspended and if isolation of Brucella melitensis, lost of status by holding and depopulation if herd is placed in low prevalence area

Notification system in place

Since 1952, at least(Epizootic Diseases Law)
At the moment by Animal Helth Law 8/ 2003

Results of the investigation

Herd prevalence: 2,79%
Animal prevalence: 0,25%
Herd incidence: 1,46%
Herd status: 55,03% OMF; 35,42% free

National evaluation of the recent situation, the trends and sources of infection

Data obtained by implementation of Spanish Programme for Eradication and Monitoring of Brucellosis in Sheeps and Goats show a moderade but continous decrease of the disease in the country, following the trends of previous years:
Herd prevalence:7,18%(2002);5,58%(2003);5,12%(2004);4,43%(2005);3,20(2006); 2,79(2007)
Animal prevalence:0,98%(2002);0,87%(2003);0,61%(2004);0,45%(2005);0,34(2006);0,25(2007)
Explanation of this still high prevalence can be found in special managemment of this type of animals: ranching systems, common grazing, trashumance...Wildlife can also be a source of infection in these holdings. Relative high influence have the limitations of the diagnostic tests used in sheep and goats.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

The human cases have been identified mainly as Brucella melitensis, caused by direct contant between humans and infected herds, as a professional disease (farmers, veterinary surgeons...).

C. Brucella melitensis in goats

Status as officially free of caprine brucellosis during the reporting year

Free regions

Canarias by Decision 2001/ 292/ EC

Monitoring system

Sampling strategy

see brucella melitensis in sheep

Frequency of the sampling

see brucella melitensis in sheep

Methods of sampling (description of sampling techniques)

see brucella melitensis in sheep

Case definition

see brucella melitensis in sheep

Diagnostic/ analytical methods used

see brucella melitensis in sheep

Vaccination policy

see brucella melitensis in sheep

Other preventive measures than vaccination in place

see brucella melitensis in sheep

Control program/ mechanisms

The control program/ strategies in place

see brucella melitensis in sheep

Recent actions taken to control the zoonoses

see brucella melitensis in sheep

Suggestions to the Community for the actions to be taken

see brucella melitensis in sheep

Measures in case of the positive findings or single cases

see brucella melitensis in sheep

Notification system in place

see brucella melitensis in sheep

Results of the investigation

see brucella melitensis in sheep

National evaluation of the recent situation, the trends and sources of infection

see brucella melitensis in sheep

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

see brucella melitensis in sheep

Table Brucellosis in other animals

	Source of information	Sampling unit	Units tested	Total units positive for Brucella spp.	B. melitensis	B. abortus	B. suis	Brucella spp., unspecified
Pigs	B	animal	23955	0				
Deer								
- from hunting - Surveillance	A	animal	1223	11	2			9
wild								
fallow deer								
- in total - Surveillance	A	animal	13	0				
roe deer								
- in total - Surveillance	A	animal	222	0				
Wild animals								
- from hunting - Surveillance (Iberian Ibex (Capra Pyrenaica))	B	animal	119	0				
Mouflons								
- from hunting - Surveillance	B	animal	15	0				
Wild boars								
wild								
- in total - Surveillance	A	animal	1483	124				124
Hares								
wild								
- in total - Surveillance	A	animal	119	0				
Cattle (bovine animals)								
- at slaughterhouse	F	animal	2293589	3886				3886
Solipeds, domestic								
horses								
- at slaughterhouse	F	animal	24314	0				

Footnote

A: MINISTRY OF ENVIRONMENT AND RURAL AND MARINE AFFAIRS AND ANIMAL HEALTH SERVICES OF AUTONOMOUS COMMUNITIES. SURVEILLANCE PROGRAMME.
B: ANIMAL HEALTH SERVICE OF CATALUÑA
F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES (RESULTS OF RUTINE POSTMORTEM EXAMINATION AT SLAUGHTERHOUSE).

Table Bovine brucellosis - data on herds - Community co-financed eradication programmes

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds - period herd prevalence	% new positive herds - herd incidence
Castilla-La Mancha	3478	2192	2192	24	9	3	12.5	100	1.095	0.411
Valencia	705	678	528	1	1	0	0	77.876	0.189	0.189
La Rioja	346	284	284	0	0	0	0	100	0	0
Madrid	1746	1524	1524	23	17	1	4.348	100	1.509	1.115
Cataluña	6253	4533	4353	9	6	3	33.333	96.029	0.207	0.138
Asturias	21167	20890	20890	1	0	1	100	100	0.005	0
Castilla y León	25250	16640	16640	240	212	44	18.333	100	1.442	1.274
País Vasco	30463	6657	5716	0	0	0	0	85.865	0	0
Navarra	1959	1818	1805	0	0	0	0	99.285	0	0
Murcia	396	385	138	1	1	0	0	35.844	0.725	0.725
Andalucía	9106	7897	6683	67	55	0	0	84.627	1.003	0.823
Aragón	3450	2072	1095	3	2	0	0	52.847	0.274	0.183
Cantabria	8654	8631	8631	90	87	18	20	100	1.043	1.008
Baleares	580	473	463	0	0	0	0	97.886	0	0
Canarias	1359	1174	1174	0	0	0	0	100	0	0
Galicia	57467	46300	46300	50	3	23	46	100	0.108	0.006
Extremadura	12245	10188	10088	219	62	6	2.74	99.018	2.171	0.615
Total	184624	132336	128504	728	455	99	13.599	97.104	0.567	0.354
Total - 1	165553	143237	139722	1167	437	149	12.768	97.546	0.835	0.313

Table Bovine brucellosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Castilla-La Mancha	403248	172008	172008	172008	420	420	1548	100	0.244
Valencia	58948	26212	26212	26212	1	1	1	100	0.004
La Rioja	38838	21419	21419	21419	0	0	1	100	0
Madrid	121599	102423	102423	102423	165	165	242	100	0.161
Cataluña	640838	194453	191541	191541	309	464	627	98.502	0.161
Asturias	378840	286831	286831	286831	3	3	29	100	0.001
Castilla y León	1308645	1003706	740693	740693	2075	1998	4739	73.796	0.28
País Vasco	89420	73053	73053	73053	0	0	0	100	0
Navarra	114224	73504	73504	73503	0	0	1	100	0
Murcia	70435	11324	11324	11324	1	1	2	100	0.009
Aragón	262181	62829	62795	62795	8	8	15	99.946	0.013
Andalucía	625631	553535	500137	500137	300	300	300	90.353	0.06
Cantabria	283767	234246	234246	234246	157	155	1361	100	0.067
Baleares	35379	20603	19952	3585	0	0	0	96.84	0
Canarias	18896	17802	17802	17802	0	0	0	100	0
Galicia	945033	674563	674563	674563	312	312	1251	100	0.046
Extremadura	1057465	628129	531357	531357	1208	1129	1221	84.594	0.227
Total	6453387	4156640	3739860	3723492	4959	4956	11338	89.973	0.133
Total - 1	6212404	3928273	3819775	3749563	8465	7893	19240	97.238	0.222

Table Bovine brucellosis - data on status of herds at the end of the period - Community co-financed eradication programmes

Region	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
La Rioja	284	21419	0	0	0	0	0	0	0	0	0	0	284	21419
Valencia	679	58954	5	25	0	0	28	408	1	18	0	0	645	58503
Madrid	1524	102423	7	191	5	19	18	146	0	0	0	0	1494	102067
Cataluña	4533	435911	9	163	3	928	24	2763	75	4306	0	0	4422	427751
Asturias	20890	286831	0	0	1	11	175	781	3	94	0	0	20711	285945
Castilla-La Mancha	2181	169342	8	377	10	1555	26	2765	16	1586	23	2452	2098	160607
Castilla y León	16640	1003706	81	1962	141	14726	323	33598	125	9878	1862	132159	14108	811363
País Vasco	793	32150	0	0	0	0	0	0	0	0	0	0	793	32150
Navarra	1826	73521	0	0	0	0	0	0	27	2928	0	0	1799	70593
Murcia	385	11901	0	0	0	0	8	251	0	0	0	0	377	11650
Cantabria	8631	234246	0	0	40	2293	24	1930	0	0	1	83	8566	229940
Canarias	1174	17802	0	0	0	0	0	0	0	0	0	0	1174	17802
Baleares	473	20603	3	84	0	0	43	215	7	53	0	0	420	20251
Aragón	1094	72976	0	0	0	0	0	0	4	120	475	36105	615	36751
Andalucía	7683	531409	212	4865	49	4399	364	13925	0	0	1	309	7057	507911
Galicia	46300	674563	0	0	6	306	23	813	2	118	0	0	46269	673326
Extremadura	10189	1059675	0	0	38	6666	287	31375	104	14545	1241	139328	8582	867761
Total	125279	4807432	325	7667	293	30903	1343	88970	364	33646	3603	310436	119414	4335790
Total - 1	143252	3981440	435	13619	465	42524	1721	99908	333	22114	3211	171331	137267	3612005

Table Ovine or Caprine brucellosis - data on herds - Community co-financed eradication programmes

Region	Total number of herds	Total number of herds under the programme	Number of herds checked	Number of positive herds	Number of new positive herds	Number of herds depopulated	% positive herds depopulated	Indicators		
								% herd coverage	% positive herds - period herd prevalence	% new positive herds - herd incidence
Castilla-La Mancha	8064	7467	7467	157	39	15	9.554	100	2.103	0.522
Valencia	1724	1688	1631	61	37	4	6.557	96.623	3.74	2.269
Madrid	799	760	760	26	12	3	11.538	100	3.421	1.579
La Rioja	483	439	434	7	6	0	0	98.861	1.613	1.382
Cataluña	3618	3459	3454	188	71	7	3.723	99.855	5.443	2.056
Asturias	6211	6211	6211	0	0	0	0	100	0	0
Castilla y León	14705	12198	12196	219	178	11	5.023	99.984	1.796	1.459
Galicia	25684	25684	25684	3	3	0	0	100	0.012	0.012
Extremadura	18571	16988	16240	299	12	7	2.341	95.597	1.841	0.074
País Vasco	4079	2591	2591	0	0	0	0	100	0	0
Cantabria	3314	3314	3314	46	45	0	0	100	1.388	1.358
Navarra	2392	2392	2077	0	0	0	0	86.831	0	0
Aragón	4793	4793	4793	73	17	13	17.808	100	1.523	0.355
Andalucía	19999	19605	17515	1820	1114	70	3.846	89.339	10.391	6.36
Baleares	3724	3724	3650	0	0	0	0	98.013	0	0
Murcia	2743	2506	2506	218	96	0	0	100	8.699	3.831
Canarias	3855	3855	1081	0	0	0	0	28.042	0	0
Total	124758	117674	111604	3117	1630	130	4.171	94.842	2.793	1.461
Total - 1	128584	125086	117734	3772	1205	144	3.818	94.122	3.204	1.023

Table Ovine or Caprine brucellosis - data on animals - Community co-financed eradication programmes

Region	Total number of animals	Number of animals to be tested under the programme	Number of animals tested	Number of animals tested individually	Number of positive animals	Slaughtering		Indicators	
						Number of animals with positive result slaughtered or culled	Total number of animals slaughtered	% coverage at animal level	% positive animals - animal prevalence
Baleares	367445	276438	274908	138612	0	0	0	99.447	0
Andalucía	3989212	3602576	3443641	3443641	17980	20437	46400	95.588	0.522
Murcia	1042594	596036	596036	596036	846	782	782	100	0.142
Canarias	368940	143749	143749	42139	0	0	0	100	0
Castilla-La Mancha	3535883	3013503	3013503	3013503	7273	7273	15726	100	0.241
Valencia	526710	417522	415236	415236	907	852	1748	99.452	0.218
La Rioja	146990	142033	141916	141916	113	107	107	99.918	0.08
Madrid	117383	108568	108568	108568	986	986	1619	100	0.908
Cataluña	729029	582919	571981	571981	4545	4362	5497	98.124	0.795
Asturias	99461	88685	88685	88685	0	0	0	100	0
Castilla y León	4455344	3631449	3631449	3631449	2221	2155	5385	100	0.061
Galicia	309205	309205	309205	309205	3	3	3	100	0.001
Cantabria	79179	79179	79179	79179	55	53	57	100	0.069
País Vasco	240260	145545	145545	103484	0	0	0	100	0
Navarra	734075	734075	624546	216804	0	0	13	85.079	0
Aragón	2015548	1630343	1630343	1630343	1789	1775	6494	100	0.11
Extremadura	5138349	4002995	1724576	1724576	4818	4342	6019	43.082	0.279
Total	23895607	19504820	16943066	16255357	41536	43127	89850	86.866	0.245
Total - 1	24363350	19845279	19497490	16439957	66033	62511	129130	98.247	0.339

Table Ovine or Caprine brucellosis - data on status of herds at the end of the period - Community co-financed eradication programmes

Region	Status of herds and animals under the programme													
	Total number of herds and animals under the programme		Unknown		Not free or not officially free				Free or officially free suspended		Free		Officially free	
					Last check positive		Last check negative							
	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals	Herds	Animals
Valencia	1688	523018	5	633	11	10088	59	22291	12	5542	1281	403475	320	80989
La Rioja	439	142033	0	0	6	3120	1	509	5	117	0	0	427	138287
Madrid	760	108568	15	2170	22	843	4	107	0	0	672	99515	47	5933
Cataluña	3459	588046	3	562	86	38848	238	52761	39	16067	2523	406688	568	73120
Asturias	6211	88685	0	0	0	0	526	1765	0	0	0	0	5685	86920
Castilla y León	12196	3631449	0	0	106	60068	378	69309	336	130155	1967	549874	9409	2822043
Castilla-La Mancha	7435	3001644	3	572	80	140815	185	127944	27	14526	3022	1039852	4118	1677935
Galicia	25684	309205	0	0	0	0	2	337	0	0	0	0	25682	308868
Cantabria	3314	79179	0	0	31	2667	7	219	0	0	0	0	3276	76293
País Vasco	4076	240217	0	0	0	0	0	0	0	0	0	0	4076	240217
Navarra	2392	734075	0	0	0	0	0	0	95	39630	589	433570	1708	260875
Aragón	4783	2011603	0	0	11	13264	15	11805	13	9353	4744	1977181	0	0
Extremadura	16993	5159926	0	0	135	126019	1469	308660	185	27999	15101	4556084	103	141164
Baleares	3724	276438	0	0	0	0	192	6893	28	1479	0	0	3504	268066
Andalucía	19704	3602576	685	70588	715	302117	3131	557832	253	50479	12178	2243147	2742	378413
Murcia	2506	578984	0	0	53	43678	231	57312	62	31665	2096	419159	64	27170
Canarias	3855	368940	0	0	0	0	0	0	0	0	0	0	3855	368940
Total	119219	21444586	711	74525	1256	741527	6438	1217744	1055	327012	44173	12128545	65584	6955233
Total - 1	125098	20123573	782	50132	1999	996174	8093	1449292	2007	336692	44800	10604323	67647	6435649

2.7. YERSINIOSIS

2.7.1. General evaluation of the national situation

A. Yersinia enterocolitica general evaluation

History of the disease and/ or infection in the country

Microbiolgical Surveillance System was the Spanish surveillance system for epidemiological surveillance of yersinia infection in humans. It is based on the number of incident cases sent by hospital laboratories to Microbiological Information System (National Centre of Epìdemiology)

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Animals are the main source of Yersinia. Fecal wastes from animals (particularly pigs) may contaminate water, milk and foods and become a source of infection for people or other animals.

Recent actions taken to control the zoonoses

The activities are made according to Regulation (EC) no 178/ 2002. (i.e. rapid alert system, traceability of food, feed, food-producing animals and all substances incorporated into foodstuffs). must be established at all stages of production, processing and distribution. To this end, business operators are required to apply appropriate systems and procedures.
At animal level, National surveys have been performed in pigs at slaugtherhouse in 2007.

2.7.2. Yersinia in foodstuffs

Table Yersinia in food

	Source of information	Sampling unit	Sample weight	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica - O:3	Y. enterocolitica - O:9	Y. enterocolitica - unspecified
Meat from pig										
fresh										
- at slaughterhouse	F	single	25g	48	3	3				
- at retail	F	single	25g	15	0					
- at cutting plant	F	single	25g	2	0					
Meat from bovine animals										
fresh										
- at slaughterhouse	F	single	25g	5	0					
- at retail	F	single	25g	5	3	3				
Meat from sheep										
fresh										
chilled										
- at retail	F	single	25g	10	0					
Meat from poultry, unspecified										
fresh										
- at slaughterhouse	F	single	25g	25	0					
- at retail	F	single	25g	10	0					
Meat from turkey										
fresh										
- at retail	F	single	25g	41	9	9				
Meat, mixed meat										
minced meat	F	single	25g	10	4	4				
Other processed food products and prepared dishes	F	single	25g	45	0					
Other food	F	single	25g	5	0					
Meat from broilers (Gallus gallus)										
fresh										
- at cutting plant	F	single	25g	21	4	4				

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES.

2.7.3. Yersinia in animals

A. Yersinia enterocolitica in pigs

Monitoring system

Sampling strategy

Animals at slaughter (herd based approach)

Samples have been taken randomly in 8 representative slaughterhouses of Spain.
Samples have been taken only if the slaughter batch had 10 or more animals, and belonging to different herds.
Samples have been taken between march and september
Number of samples: 228, belonging to 114 slaughter batches (different herds)

Frequency of the sampling

Animals at slaughter (herd based approach)

Sampling takes place during the months march and september

Type of specimen taken

Animals at slaughter (herd based approach)

Faeces

Methods of sampling (description of sampling techniques)

Animals at slaughter (herd based approach)

2 faecal material samples by slaughter batch and by herd

Case definition

Animals at slaughter (herd based approach)

a slaughter batch is considered as positive if isolation by bacteriological method in at least one of the samples of the slaughter batch

Diagnostic/ analytical methods used

Animals at slaughter (herd based approach)

Bacteriological method: ISO 10273:2003

Results of the investigation

Number of slaughter batches analyzed: 114
Number of slaughter batches positive: 22
Slaughter batch prevalence: 19,3% (IC 95%, 12,5-27,7)

Table Yersinia in animals

	Source of information	Sampling unit	Units tested	Total units positive for Yersinia spp.	Y. enterocolitica	Yersinia spp., unspecified	Y. enterocolitica - O:9	Y. enterocolitica - O:3	Y. enterocolitica - unspecified
Pigs	A	slaughter batch	114	22	22				

Footnote

A: Ministry of Environment and Rural and Marine Affairs. National survey.

2.8. TRICHINELLOSIS

2.8.1. General evaluation of the national situation

A. Trichinellosis general evaluation

History of the disease and/ or infection in the country

Trichinellosis is a notifiable zoonosis, which causes two to three outbreaks per year in Spain. In 1995, the National Network of Epidemiological Surveillance (NNES) developed a standard protocol to detect every single case of trichinellosis, and notify the health authorities as quickly as possible when an outbreak occurs

National evaluation of the recent situation, the trends and sources of infection

Sources of infection are mainly associated to the consume of meat and raw meat products of wild boars killer in hunting or pigs slaughtered at home and which carcases has not been examinated post-mortem.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Most cases are caused by Trichinella spiralis. Trichinella britovi has previously been associated with outbreaks due to the consumption of boar meat, and meat from other wild animals but in the last years T britovi was associated with pork meat and transmitted through the consumption of meat from a domestic pig.

Recent actions taken to control the zoonoses

The activities against this zoonoses are the Official Control:
Examination of fresh meat and killed in hunting according to European legislation in force:
Commission Regulation (EC) Number 2075/ 2005 of December 5, 2005 laying down specific rules on official controls for trichinella in meat and Commission Regulation (EC) Number 1665/ 2006 amending Comission Regulation (EC) Number 2075/ 2005)
Domestic killing for self consumption and wild game meat to be sold at retail is regulated by the Spanish Royal Decree 640/ 2006, of May 26, 2006, laying down specific implementation conditions of the Communities rules concerning hygiene subjets, as well as foodstuff's production and commercialisation.
According to article seven of the Commission Regulation (EC) Number 2075/ 2005 of December 5, 2005, laying down specific rules on official controls for Trichinella in meat, Spain has prepared a contingency plan outlining all action to be taken when samples referred to in articles 2 and 16 test are positive to Trichinella. This plan includes details covering:
(a) traceability of infested carcase(s);
(b) measures for dealing with infested carcase(s) and parts thereof;
(c) investigation of the source of investigation and any spreading among wildlife;
(d) any measures to be taken at retail or consumer level;
(e) measures to be taken where the infested carcase(s) cannot be identified at the slaughterhouse;
(f) determination of the Triquinella species involved.

In Spain the Triquinella examination is compulsory for meat from trichinella susceptible species, including domestic killing for self-consumption.

2.8.2. Trichinella in animals

Table Trichinella in animals

	Source of information	Sampling unit	Units tested	Total units positive for Trichinella spp.	T. spiralis	Trichinella spp., unspecified
Pigs						
fattening pigs						
- at slaughterhouse	F	animal	41198179	48		48
- at slaughterhouse - domestic production	F,f	animal	75514	4		4
Solipeds, domestic						
horses						
- at slaughterhouse	F	animal	24314	0		
Wild boars						
wild						
- at game handling establishment	F	animal	51718	103		103
Foxes						
wild	F	animal	22	1		1
Badgers						
wild	F	animal	342	0		
Mouflons						
wild	F	animal	137	0		
Deer						
wild						
- at game handling establishment	F	animal	94773	0		

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES (RESULTS OF RUTINE POSTMORTEM EXAMINATION AT SLAUGHTERHOUSE).
f: domestic killing for self consumption.

2.9. ECHINOCOCCOSIS

2.9.1. General evaluation of the national situation

A. Echinococcus spp. general evaluation

History of the disease and/ or infection in the country

Hydatidosis is an endemic disease in Spain, mainly in regions with extensive systems of animal production.
Human hydatidosis has been an Mandatory Notifiable disease since 1982, year in which were comunicated around 2000 cases.Royal Decree 2210/ 1995, laying down the National Epidemiologyc Surveillance Network, classify hydatidosis as an endemic disease at regional frame.
In 80´s many regions started to set up a control programme based in control of animal hydatidosis and in general people´s health education and focused in professionals related with animals and at school level. Similar control programmes have been developed in others Authonomous Communities.
The implementation of these control programmes got good results in the decrease of the incidence of the disease.
Routine post-mortem examination at slaughterhouse have being carried out according to european legislation in force (Hygiene Package).

National evaluation of the recent situation, the trends and sources of infection

Control programmes in endemic regions got good results in the dicrease of the disease at human level.Main source of infection in Spain is cycle between sheep,dog and humans.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Higher incidence values of human cases are situated in regions with the highest census of sheep and goats.

Recent actions taken to control the zoonoses

Surveillance according to Directive 2003/ 99/ EEC.
Control programmes in endemic regions.
Inclusion in National Epidemiologyc Surveillance Network according to Royal Decree 2210/ 1996.
The activities against this zoonoses are the Official Control in fresh meat according to european Legislation in force (Hygiene package).

2.9.2. Echinococcus in animals

Table Echinococcus in animals

	Source of information	Sampling unit	Units tested	Total units positive for Echinococcus spp.	E. granulosus	E. multilocularis	Echinococcus spp., unspecified
Cattle (bovine animals)							
- at slaughterhouse	F	animal	2293589	11353			11353
Pigs							
- at slaughterhouse	F	animal	41198179	10224			10224
- at slaughterhouse - domestic production	F,f	animal	75514	611			611
Solipeds, domestic							
horses							
- at slaughterhouse	F	animal	24314	2			2
Sheep and goats							
- at slaughterhouse	F	animal	15264161	87485			87485
Wild boars							
- at game handling establishment	F,f	animal	48975	62			62
Deer							
wild							
- at game handling establishment	F	animal	97516	10			10

Footnote

F: HUMAN PUBLIC HEALTH SERVICES OF THE AUTONOMOUS COMMUNITIES (RESULTS OF RUTINE POSTMORTEM EXAMINATION AT SLAUGHTERHOUSE).
f: domestic killing for self consumption.

2.10. TOXOPLASMOSIS

2.10.1. General evaluation of the national situation

A. Toxoplasmosis general evaluation

History of the disease and/ or infection in the country

Toxoplasmosis in production animals has been associated classically to the production of miscarriage.The main source of infection is linked to the contamination of feed by cat faeces, although the use of dung in pasture natural fertilitation has to be considered as an important source of infection for adults.
For humans, there are two main sorces of infection: contact with cats and comsumtion of vegetables, water or animal products, mainly sheep and pig meat.
In 60's and 70's studies in some regions of Spain detected prevaleces between 12-45% in sheep; between 11- 42% in pig;and between 14-36%in cattle.
More recent studies seem prevalences between 30-57% in sheep;between 41-62% in pig;and between 25-43% in cattle.
In cats, the incidence founded by private clinics are close to 30%.

National evaluation of the recent situation, the trends and sources of infection

In 2003, data comunicated by Autonomous Comunities about toxoplasmosis in production animals showed incidence in sheep of 35,4%;19% in cattle and 18% in goats.
Main sources of infection for humans are cats and comsumption of meat insufficientment cooked.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

More studies need to be developed.

Recent actions taken to control the zoonoses

Surveillance according to Directive 2003/ 99/ EC
Primary prevention of the disease with recommendations to prevent infection during pregnance in humans

2.10.2. Toxoplasma in animals

Table Toxoplasma in animals

	Source of information	Sampling unit	Units tested	Total units positive for Toxoplasma	Toxoplasma spp., unspecified	T. gondii
Sheep	A	animal	56	9	9	
Goats	A	animal	19	7	7	
Mouflons						
wild						
- from hunting - Survey	A	animal	16	1	1	
Barbary sheep						
wild						
- from hunting - Survey		animal	36	1	1	
Other ruminants						
wild						
- from hunting - Survey (Iberian ibex, Spanish ibex, Spanish wild goat, or Iberian wild goat (Capra pyrenaica))	A	animal	18	0		
Foxes						
wild						
- from hunting - Survey	A	animal	8	0		

Footnote

A: ANIMAL HEALTH SERVICES OF AUTONOMOUS COMMUNITIES

2.11. RABIES

2.11.1. General evaluation of the national situation

A. Rabies general evaluation

History of the disease and/ or infection in the country

Paralytic and furious forms of rabies are described in the second book of the Hunting Agreement in the time of King Alfonso XI(1312-1350).The Royal Assembly of Health publication of 23 November 1786 adopted measures to avoid transmission of rabies controlling movement of dogs and cats.Royal Order of 1863 describes "measures of preservation that one has to follow in each case where the bite has been from a supposed rabid animal" and also set down the measures against rabies in animals, which were to be adopted by Local Authorities.At the beginning of the 20th century the Law of 18 December 1914 and Regulation of 4 June 1915 are approved to prevent the transmission of human rabies.During the 1940s the first statistics on animal rabies appeared(513 dog cases in 1944 and 24 human cases).On 12 May 1947 the Ministry of Agriculture issued a General Order establishing the measures to be taken against rabies and a second Order of 1948 established the norms for animal vaccination and control.During the 1950s the first mass dog vaccination campaigns took place.The Epizootics Law of 20 December 1952 established the general regulations of the anti-rabies programme.
Urban rabies has been the main epidemiologycal form in the history of the disease in Spain, with dogs as reservoir of the infection.
Spain is free of land rabies since 1966, with exception of Ceuta and Melilla, that have a regular notification of cases of rabies by their situation in North Africa, where rabies is endemic.
In penínsular territory an imported focus was reported in 1975 in the province of Málaga by introduction of dogs coming from North Africa. This focus ended in 1977 with 122 animals infected(dogs and cats, and 2 foxes) and one case of human rabies.
Since 1979 only have beed notificated cases of rabies in peninsular territory by EBLV1 in bats(Eptesicus serotinus) of the south and east.

National evaluation of the recent situation, the trends and sources of infection

Since 1978 Spainsh mainland and islands remains free of rage in terrestrial mammals. Only a few cases of EBL1 has been reported in bats.
These data shows that the main source and risk for the apparition of cases of rabies in Spain is the importation of animals with the infection from Morocco and other countries of North Africa.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

Since 1975 no human cases has been reported in peninsular territory and island.

Recent actions taken to control the zoonoses

Compulsory surveillance of the disease according to article 4 of Directive 2003/ 99/ EEC,came into force by Royal Decree 1940/ 2004.
Compulsory vaccinatión of dogs in 10 autonomous comunities and Ceuta y Melilla. Voluntary in the

rest.
Studies including active surveillance of LB-1 in bats.
Information to the citizens about no manipulation of bats.

2.11.2. Lyssavirus (rabies) in animals

A. Rabies in dogs

Monitoring system

Sampling strategy

Sampling strategy is targeted at 3 levels:
1. apparently healthy dogs that injure a person and die into the quarantine(kept under observation) period of 14 days or if the animal is suspected to be rabid(euthanasia).Samples are taken by competent authority
2.dogs and cats imported from third countries not included in part C of Annex II of Council Regulation(EC) 998/ 2003)need negative results to enter into Spain.If theses animals belong to spanish citizens coming from these third countries samples are taken when arrival to Spain.
3.dogs and cats that are going to travel to United Kingdom, Ireland, Sweeden, Norwey and Malta.Samples are taken by private clinics and analisys performed by National Reference Laboratory

Frequency of the sampling

indeterminated

Type of specimen taken

Other: Brain, Blood

Methods of sampling (description of sampling techniques)

Brain of dead or sacrified animals have to be sent to National Reference Laboratory following a protocol of sending.The sample has to be taken with sterility, be submerged in salinum serum and glicerine in 50% solution and envoided refrigerated quickly.
Blood are taken by private clinics and serum(0,5 ml minimun) have to be sent following a protocol, by a quick transport service refrigerated or frozen.4948 samples have been taken in 2004.

Case definition

According to Decision No. 2119/ 98/ EC of the European Parliament and of the Council, Commission Decision 2002/ 253/ EC and Commission Decision 2002/ 543/ EC

Diagnostic/ analytical methods used

Other: FAT, ELISA

Vaccination policy

Compulsory vaccination of dogs in 10 regions, Ceuta and Melilla.
Voluntary vaccination of dogs in 5 regions.

Other preventive measures than vaccination in place

Control of animals coming from third countries not included in part C of Annex II of Council Regulation(EC) 998/ 2003
Identication and registration of dogs.
Pick up of stray dogs by council town authorities.

Control program/ mechanisms

The control program/ strategies in place

Different regional prevention programmes.
Control of imports and exports according to Council Regulation(EC) 998/ 2003.

Recent actions taken to control the zoonoses

Imports of third countries not included in part C of Annex II of Council Regulation(EC) 998/ 2003)

Measures in case of the positive findings or single cases

Mandatory Notifiable disease Royal Decree 2210/ 1995, december 25, by Epidemiological Surveillance National Net is created.
Oficcial Notification of the disease
Epidemiologic survey
Cases in Spain (Ceuta and Melilla) are imported from third countries

Notification system in place

Since 1952, at least, by Epizootic Law.
At the moment by Animal Health Law 8/ 2003.

Results of the investigation

Not cases.

Investigations of the human contacts with positive cases

All the people bitten by an suspected animal are investigated and complete treatment (vaccine and Ig against rage is offered to them.

Relevance of the findings in animals to findings in foodstuffs and to human cases (as a source of infection)

High

2.12. Q-FEVER

2.12.1. General evaluation of the national situation

2.12.2. Coxiella (Q-fever) in animals

3. INFORMATION ON SPECIFIC INDICATORS OF ANTIMICROBIAL RESISTANCE

3.1. ENTEROCOCCUS, NON-PATHOGENIC

3.1.1. General evaluation of the national situation

3.1.2. Antimicrobial resistance in Enterococcus, non-pathogenic isolates

A. Antimicrobial resistance of E. faecium in animal

Sampling strategy used in monitoring

Frequency of the sampling

Samples from pigs : between the months of march and september
Samples from poultry: between the months of may and november
Samples from cattle: between the months of june and november

Type of specimen taken

faeces taken at colon (pigs and cattle) and caecum (poultry) level

Methods of sampling (description of sampling techniques)

Pigs: sampling at 8 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
460 samples belonging to 230 slaughter batch have been taken in 2007.
Poultry: sampling at 7 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
3 samples have been taken from each slaughter batch, belonging to different flocks.
267 samples belonging to 89 slaughter batch have been taken in 2007.
Cattle: sampling at 8 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
326 samples belonging to 163 slaughter batch have been taken in 2007.

Procedures for the selection of isolates for antimicrobial testing

All the isolates have been selected for antimicrobial testing.

Methods used for collecting data

Data are collected at national level.

Laboratory methodology used for identification of the microbial isolates

Culture and isolation in agar M-esterococcus.
Identification by Rapid ID32 Strep.

Laboratory used for detection for resistance

Antimicrobials included in monitoring

See tables

Breakpoints used in testing

See table of breakpoints

Preventive measures in place

Pigs:
number of isolates tested: 58
high level of antimicrobial resistance to Lincomycin (94,8 CI 95%:88,1;99,6), Erythromycin (63,8% CI 95%:50,1;76,0), Tetracyclin (72,4% CI 95%:59,1;83,3), Bacitracin (41,4% CI 95%:28,6;55,1) and Quinupristin/ Dalfopristin (91,3 CI 95%:99,9;96,7).Low level of resistance to Trimethoprim, Gentamicin, Amoxicillin and Vancomycin.
Poultry (Gallus gallus):
number of isolates tested: 38
high level of resistance to Lincomycin (84,2% CI 95%:70,0;93,3), Ciprofloxacin (71,1% CI 95%:54,1;84,6), Tetracyclin (73,6% CI 95%:58,0;85,7), Erythromicin (68,4% CI 95%:52,4;81,6), Penicillin (50% CI 95%:33,4;66,6) and Quinupristin/ Dalfopristin (81,5 CI 95%:66,9;91,5). Low level of resistance to Vancomycin.
Cattle:
number of isolates tested: 17
high level of resistance to Lincomycin (100% CI 95%:80,5;100), Tetracyclin (58,8% CI 95%:32,9;81,6), Ciprofloxacin (47,1% CI 95%:22,98;72,2) and Quinupristin/ Dalfopristin (82,3% CI 95%:59,1;95,3)

Table Antimicrobial susceptibility testing of E. faecium in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	E. faecium
	Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	58

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	500	58	1														57	1					
Streptomycin	2000	58	17									1	3	9	11	17					17		
Amphenicols																							
Chloramphenicol	32	58	0							1	2	35	19	1									
Fluoroquinolones																							
Ciprofloxacin	2	58	11				2	17	17	11	10		1										
Glycopeptides (Cyclic peptides, Polypeptides)																							
Bacitracin	64	58	24								11	7	4	3	9	7	3	14					
Vancomycin	4	58	1					36	17	4		1											
Lincosamides																							
Lincomycin	8	58	55						2			1	55										
Macrolides																							
Erythromycin	4	58	37			3	3	3	2	4	6	4	1			32							
Orthosomycins																							
Avilamycin	8	58	1						6	17	31	3			1								
Penicillins																							
Amoxicillin	4	58	1							48	9	1											
Penicillin	8	58	20	1					4	13	14	6	5	15									
Streptogramins																							
Quinupristin/ Dalfopristin	1	58	53					2	3	14	24	14	1										
Tetracyclines	2	58	42						16				1	2	7	32							
Trimethoprim	8	58	1								56	1			1								

Table Antimicrobial susceptibility testing of E. faecium in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	E. faecium
	Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	17

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	500	17	0														17	0					
Streptomycin	2000	17	1									3	5	1					7	1			
Amphenicols																							
Chloramphenicol	32	17	0								5	7	4	1									
Fluoroquinolones																							
Ciprofloxacin	2	17	8					4	3	2	3	2	3										
Glycopeptides (Cyclic peptides, Polypeptides)																							
Bacitracin	64	17	3								4	6	1	3			1	2					
Vancomycin	4	17	0					11	1	4	1												
Lincosamides																							
Lincomycin	8	17	17										17										
Macrolides																							
Erythromycin	4	17	5			3		5	2		2	2				3							
Orthosomycins																							
Avilamycin	8	17	0						1	8	7	1											
Penicillins																							
Amoxicillin	4	17	2							15		1	1										
Penicillin	8	17	4					1	3	2	4	3	2	2									
Streptogramins																							
Quinupristin/ Dalfopristin	1	17	14					2	1	10	4												
Tetracyclines	2	17	10						7				1		3	6							


Trimethoprim
8
17
1
16
1

Table Antimicrobial susceptibility testing of E. faecium in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	E. faecium
	Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	38

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	500	38	6														32	6					
Streptomycin	2000	38	8									1	5	11	5	8				8			
Amphenicols																							
Chloramphenicol	32	38	0							1	3	24	9	1									
Fluoroquinolones																							
Ciprofloxacin	2	38	27						4	7	10	7	10										
Glycopeptides (Cyclic peptides, Polypeptides)																							
Bacitracin	64	38	15								8	5	2	4	4	3	4	8					
Vancomycin	4	38	0					24	6	8													
Lincosamides																							
Lincomycin	8	38	32						1	4		1	32										
Macrolides																							
Erythromycin	4	38	26			5	1		1	1	4	5	1	1		19							
Orthosomycins																							
Avilamycin	8	38	16						3	6	12	1	1	3	12								
Penicillins																							
Amoxicillin	4	38	8							23	7	2	2	3	1								
Penicillin	8	38	19						3	3	6	7	5	14									
Streptogramins																							
Quinupristin/ Dalfopristin	1	38	31					5	2	19	9	1	2										
Tetracyclines	2	38	28						10			1		4	11	12							
Trimethoprim	8	38	9								27	2		2	7								

Table Breakpoints for antibiotic resistance of Enterococcus, non-pathogenic in Animals

Test Method Used

Broth dilution

Standards used for testing

EFSA

Enterococcus, non-pathogenic	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Tetracyclines	EFSA J.			2	1	64				
Amphenicols										
Chloramphenicol	EFSA J.			32	2	32				
Florfenicol	VAV			16						
Fluoroquinolones										
Ciprofloxacin	VAV			2	0.25	8				
Trimethoprim	VAV			8	4	32				
Aminoglycosides										
Streptomycin (1)	VAV			2000	2	64				
Gentamicin (2)	VAV			500	500	500				
Macrolides										
Erythromycin	EFSA J.			4	0.12	64				
Glycopeptides (Cyclic peptides, Polypeptides)										
Bacitracin	VAV			64	4	256				
Vancomycin	EFSA J.			4	0.5	64				
Lincosamides										
Lincomycin	VAV			8	1	8				
Orthosomycins										
Avilamycin	VAV			8	0.5	32				
Penicillins										
Amoxicillin (3)	EFSA J.			4	2	32				
Penicillin	VAV			8	0.06	16				
Streptogramins										
Quinupristin/ Dalfopristin	EFSA J.			1	0.5	32				

(1) : High Level Resistance using a single 2.000 microlitres/ ml well plus a range as stated into the table
(2) : High Level Resistance
(3) : EFSA J. breakpoint for ampicillin was used also for amoxicillin

3.2. ESCHERICHIA COLI, NON-PATHOGENIC

3.2.1. General evaluation of the national situation

A. Escherichia coli general evaluation

History of the disease and/ or infection in the country

E. coli cause many infections in humans, with intestinal and extra-intestinal forms. In production animals E. coli diseases are very frequent, mainly in newborns or animals few days old of cattle, pork and sheep.Problems are often too in farms of poultry and rabbits.
Several cases and outbreaks of diarrhea for Enteropatogenic E. coli have been detected since 60´s, but these focus have reduced importantly in last decades.Serotypes in rabbits or rumiants are different than human ones.In Spain, the main serotype in rabbits is O103:H2.
E. coli Enterotoxicogenic are more frecuent associated with focus of gastroenteritis in humans, by consume of water and animal products.But predominant human serotypes in Spain(O25:H-;O153:H45;O169:H41) are different than the ones that causes diarrhea in animals. In piglets predominat serotypes are O138:K81:H14;O141:K85ab:H-;O149:K91:H10;O157:H-.

National evaluation of the recent situation, the trends and sources of infection

In production animals diseases by E. coli are very frequent. Although E. coli strains that cause infections in humans and animals can share many virulence factors, they often show different serotypes.Therefore, E.coli strains patogenic for animals are infrequent to produce infections in humans, but it is proved that animals can be a reservoir of Enteropathogenic E. coli for humans.
Enviroment and water can also be a source of infecction.

Relevance of the findings in animals, feedingstuffs and foodstuffs to human cases (as a source of infection)

It is very difficult to establish the relevance of findings as sources of infection, because E. coli is a very ubiquitous agent and strains patogenic for animals are infrequent to produce infections in humans.

3.2.2. Antimicrobial resistance in Escherichia coli, non-pathogenic isolates

A. Antimicrobial resistance of E.coli in animal

Sampling strategy used in monitoring

Frequency of the sampling

Samples from pigs : between the months of march and september
Samples from poultry: between the months of may and november
Samples from cattle: between the months of june and november

Type of specimen taken

faeces taken at colon (pigs and cattle) and caecum (poultry) level

Methods of sampling (description of sampling techniques)

Pigs: sampling at 8 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
460 samples belonging to 230 slaughter batch have been taken in 2007.
Poultry: sampling at 7 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
3 samples have been taken from each slaughter batch, belonging to different flocks.
267 samples belonging to 89 slaughter batch have been taken in 2007.
Cattle: sampling at 8 slaughterhouses belonging to different regions of Spain and representative of the total volume of sacrifice of the country.
2 samples have been taken from each slaughter batch, belonging to different herds.
326 samples belonging to 163 slaughter batch have been taken in 2007.

Procedures for the selection of isolates for antimicrobial testing

All the isolates have been selected for antimicrobial testing.

Methods used for collecting data

Data are collected at national level.

Laboratory methodology used for identification of the microbial isolates

Culture and isolation in selective medium (agar McConkey).
Confirmation by biochemical test API 20E

Laboratory used for detection for resistance

Antimicrobials included in monitoring

see tables

Breakpoints used in testing

see table of breakpoints

Results of the investigation

Pigs:
number of isolates tested: 229
high level of antimicrobial resistance to Tetracyclin (92,6% CI 95%:88,4;95,6),Sulfonamides (66,4% CI 95%:59,8;72,5),Streptomycin (65,5% CI 95%:58,9;71,6),Trimethoprim (67% CI 95%:60,3;78,9)and Amoxicillin (60,6% CI 95%:53,2;66,2). Low levels of resistance to Quinolones and Fluoroquinolones and no resistance to 3rd generation Cephalosporins.
Poultry (Gallus gallus):
number of isolates tested: 87
high level of antimicrobial resistance to Quinolones (Nalidixic acid: 72,4% CI 95%:61,8;81,5), Fluoroquinolones (Ciprofloxacin: 78,16% CI 95%:68,5;85,8),Tetracyclin (64,4% CI 95%:53,4;74,4),Streptomycin (54% CI 95%:42,9;64,7) and Amoxicillin (66,6% CI 95%:56,2;75,9). Moderate level of resistance to Cephalosporins (Cefotaxim: 24,1%; Cefoxitin: 3,4%; Ceftazidim: 2,3%.
Cattle:
number of isolates tested: 158
high level of antimicrobial resistance to Tetracyclin (55,1 CI 95%:46,9;62,9),Sulfonamides (42,4% CI 95%:34,6;50,5)and Streptomycin (44,3% CI 95%:36,4;52,4). Low levels of resistance to Quinolones and Fluoroquinolones and no resistance to Cephalosporins.

Table Antimicrobial susceptibility testing of E. coli in animals

n = Number of resistant isolates	E. coli							
	Cattle (bovine animals)		**Pigs**		**Gallus gallus (fowl)**		**Turkeys**	
Isolates out of a monitoring programme	yes		yes		yes			
Number of isolates available in the laboratory	158		229		87			
Antimicrobials:	**N**	**n**	**N**	**n**	**N**	**n**	**N**	**n**
Aminoglycosides								
Amikacin	158	0	229	0	87	0		
Apramycin	158	2	229	3	87	1		
Gentamicin	158	6	229	11	87	9		
Neomycin	158	12	229	28	87	15		
Streptomycin	158	70	229	150	87	47		
Amphenicols								
Chloramphenicol	158	20	229	79	87	27		
Florfenicol	158	5	229	4	87	0		
Carbapenems								
Imipenem	158	0	229	0	87	0		
Cephalosporins								
3rd generation cephalosporins	158	0						
Cefotaxim	158	0	229	2	87	21		
Cefoxitin	158	0	229	0	87	3		
Ceftazidim	158	0	229	0	87	2		
Fluoroquinolones								
Ciprofloxacin	158	3	229	41	87	68		
Monobactams								
Aztreonam	158	0	229	0	87	1		
Penicillins								
Amoxicillin	158	43	229	139	87	58		
Quinolones								
Nalidixic acid	158	3	229	39	87	63		
Sulfonamides								
Sulfonamide	158	67	229	152	87	43		
Tetracyclines								
Tetracyclin	158	87	229	212	87	56		
Trimethoprim	158	40	229	153	87	33		

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	E. coli
	Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	158

Antimicrobials:	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																															
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																
Amikacin	14	158	0													2	18	21	25	22	28	31	11									
Apramycin	13	158	2				2													11	41	49	40	11	4							
Carbapenems																																
Imipenem	13	158	0																							6	34	44	50	12	9	3
Cephalosporins																																
Cefoxitin	14	158	0																	1	3	18	29	33	51	16	4	1	1		1		
Ceftazidim	14	158	0																							3	10	30	49	41	18	6	1
Monobactams																																
Aztreonam	15	158	0																										1	10	10	32	105
Sulfonamides																																
Sulfonamide	12	158	67	67												2	4		5	17	8	15	15	13	4	3	1	3		1		
Trimethoprim	10	158	40	40																	1	9	11	14	32	26	10	11	1	3			

Table Antimicrobial susceptibility testing of E. coli in Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	E. coli
	Gallus gallus (fowl) - broilers - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	87

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																														
				<=6	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																		
Amikacin	14	87	0													1	3	4	5	6	27	30	11										
Apramycin	13	87	1					1												1	7	18	41	18	1								
Carbapenems																																		
Imipenem	13	87	0																					2	1	5	23	25	16	13	2		
Cephalosporins																																		
Cefoxitin	14	88	4			1	1	1	1					1		1			2	2	4	9	15	17	23	9	1							
Ceftazidim	14	87	2								1	1	1			5	1	1	4		1				2	8	19	19	16	8				
Monobactams																																		
Aztreonam	15	87	1						1						5		2			4	1	2	1		1	1	2		2	5	7	16	37	
Sulfonamides																																		
Sulfonamide	12	87	43	43											2	1	5	2	8	6	3	6	5	4	2									
Trimethoprim	10	87	33	33										1						2	1	12	8	10	8	7	2	2				1		

Table Antimicrobial susceptibility testing of E. coli in Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	E. coli Cattle (bovine animals) - young cattle (1-2 years) - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	158

Antimicrobials:	**Break point**	**N**	**n**	**Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to**																			
				<=0.03	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	158	6				9	100	39	4		1	2	1	1	1							
Neomycin	8	158	12					23	72	48	3		3	2	4	3							
Streptomycin	16	158	70							10	45	29	4	22	15	33							
Amphenicols																							
Chloramphenicol	16	158	20							15	96	25	2	4	3	5	5	3					
Florfenicol	16	158	5								127	25	1			1	4						
Cephalosporins																							
Cefotaxim	0.25	158	0	17	80	56	5																
Fluoroquinolones																							
Ciprofloxacin	0.06	158	3		155	1	1	1															
Penicillins																							
Amoxicillin	8	158	43						4	25	54	32	10					33					
Quinolones																							
Nalidixic acid	16	158	3						7	116	30	2					3						
Tetracyclines																							
Tetracyclin	8	158	87					5	40	17	6	3	2	10	30	41	4						

Table Antimicrobial susceptibility testing of E. coli in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Diffusion method]

	E. coli
	Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	229

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																																
	Break point	**N**	**n**	**<=6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**>=35**
Aminoglycosides																																	
Amikacin	14	229	0												1	12	60	80	39	27	7	3											
Apramycin	13	229	3				2	1										1	12	17	96	69	27	4									
Carbapenems																																	
Imipenem	13	229	0																			1			5	20	42	74	52	28	5	2	
Cephalosporins																																	
Cefoxitin	14	228	0													1		2		3	20	44	75	38	35	7	2	1					
Ceftazidim	14	229	0																		1	1			1	24	52	79	33	27	7	3	1
Monobactams																																	
Aztreonam	15	229	0																		1	1						1	5	30	63	58	70
Sulfonamides																																	
Sulfonamide	12	229	152	152																2	7	16	13	12	13	9	2	3					
Trimethoprim	10	229	153	153										1		1		1				7	13	17	15	10	4	6	1				

Table Antimicrobial susceptibility testing of E. coli in Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey - quantitative data [Dilution method]

	E. coli
	Pigs - fattening pigs - at slaughterhouse - animal sample - faeces - Monitoring - monitoring survey
Isolates out of a monitoring programme	yes
Number of isolates available in the laboratory	229

Antimicrobials:	Number of resistant isolates (n) and number of isolates with the concentration (u/ ml) or zone (mm) of inhibition equal to																						
	Break point	**N**	**n**	**<=0.03**	**0.06**	**0.12**	**0.25**	**0.5**	**1**	**2**	**4**	**8**	**16**	**32**	**64**	**128**	**256**	**512**	**1024**	**2048**	**>2048**	**lowest**	**highest**
Aminoglycosides																							
Gentamicin	2	229	11				32	139	40	7	4	1	1	1	2	2							
Neomycin	8	229	28					48	98	43	6	6	8	8	8	4							
Streptomycin	16	229	150							3	27	18	31	52	35	63							
Amphenicols																							
Chloramphenicol	16	223	73							6	90	44	10	23	30	14	6						
Florfenicol	16	229	4								128	78	19	2	2								
Cephalosporins																							
Cefotaxim	0.25	229	2	20	140	63	4	1		1													
Fluoroquinolones																							
Ciprofloxacin	0.06	229	41		188	2	12	15	5		2	3	1		1								
Penicillins																							
Amoxicillin	8	229	139						3	7	52	28	2	2			3	132					
Quinolones																							
Nalidixic acid	16	229	39						2	95	89	4		3	3	6	27						
Tetracyclines																							
Tetracyclin	8	229	212						5	8	2	2	1	7	48	127	29						

Table Breakpoints used for antimicrobial susceptibility testing in Animals

Test Method Used

Disc diffusion

Broth dilution

Standards used for testing

NCCLS

EFSA_Journal

Escherichia coli, non-pathogenic	Standard for breakpoint	Breakpoint concentration (microg/ ml)			Range tested concentration (microg/ ml)		Disk content	Breakpoint Zone diameter (mm)		
		Susceptible <=	Intermediate	Resistant >	lowest	highest	microg	Susceptible >=	Intermediate	Resistant <=
Amphenicols										
Chloramphenicol	EFSAJ			16	2	256				
Florfenicol				16	4	128				
Tetracyclines										
Tetracyclin	EFSA J			8	0.5	256				
Fluoroquinolones										
Ciprofloxacin				0.06	0.06	32				
Enrofloxacin										
Quinolones										
Nalidixic acid	EFSA J			16	0.5	128				
Trimethoprim							5			10
Sulfonamides										
Sulfonamide							300			12
Aminoglycosides										
Streptomycin	EFSA J			16	2	64				
Gentamicin	EFSA J			2	0.25	64				
Neomycin	VAV			8	0.25	64				
Kanamycin										
Amikacin							30			14
Apramycin							40			13
Trimethoprim + sulfonamides										
Carbapenems										
Imipenem							10			13
Cephalosporins										
Cefotaxim	EFSA J			0.25	0.06	2				
Cefoxitin							30			14
Ceftazidim							30			14
3rd generation cephalosporins										
Monobactams										
Aztreonam							30			15
Penicillins										
Amoxicillin (1)	VAV			8	1	256				
Ampicillin										

(1) : The EFSA J. published breakpoint for ampicillin was used for amoxocillin

4. INFORMATION ON SPECIFIC MICROBIOLOGICAL AGENTS

4.1. HISTAMINE

4.1.1. General evaluation of the national situation

4.1.2. Histamine in foodstuffs

4.2. ENTEROBACTER SAKAZAKII

4.2.1. General evaluation of the national situation

4.2.2. Enterobacter sakazakii in foodstuffs

4.3. STAPHYLOCOCCAL ENTEROTOXINS

4.3.1. General evaluation of the national situation

4.3.2. Staphylococcal enterotoxins in foodstuffs

5. FOODBORNE OUTBREAKS

Foodborne outbreaks are incidences of two or more human cases of the same disease or infection where the cases are linked or are probably linked to the same food source. Situation, in which the observed human cases exceed the expected number of cases and where a same food source is suspected, is also indicative of a foodborne outbreak.

A. Foodborne outbreaks

System in place for identification, epidemological investigations and reporting of foodborne outbreaks

Royal Decree 2210/ 1995, december 25, by Epidemiological Surveillance National Net is created.
Notifiable Disease Surveillance System (NDSS)
In December of 1995 the National Network of Epidemiological Surveillance was created by law.
During 1997 the protocols of statutory notification of diseases were approved and implemented in Spain. In Spain the Autonomous Regions have wide powers with respect to epidemiological surveillance and national decisions are usually taken by consensus.
All practising doctors are obliged to notify, both those in the public health service and in private practice, and both those practising outside and within hospitals. On occasions the appearance of cases and outbreaks is detected by other means (from the mass media, from citizens complants, etc.) and in these cases the information is checked and if confirmed it is incorporated into the system at the corresponding level.
The notification may be carried out using a variety of systems: mail, fax, telephone, e-mail, etc. Presently all the regions (and in many cases levels below) transmit the data by e-mail. A network is being developed for the National Epidemiological Surveillance Network which will permit the flow of data from the local level.
The notification of outbreaks is mandatory and standardised. All the outbreaks must be reported immediately at the regional level. At the national level it is obligatory to report immediately only those outbreaks which, by law, are defined as being “supra-communitary“ (considered to be of national interest) in order to facilitate their rapid control, where as the rest of the outbreaks are reported quarterly. Some regions have set up early warning systems in order to support doctors in reporting and investigating outbreaks. A similar national system is entering into operation.
In 1997 a uniform outbreak reporting format (variables and codification) was developed in all of Spain in accordance with the one recommended by the WHO Programme. The report includes relevant information such as agent, food involved, place of consumption and contributing factors.
The results of the statistical and epidemiological analysis are disseminated in annual reports. In addition they are published in epidemiological bulletins (national, regional and other). The weekly national epidemiological bulletin can be found at: http:/ / cne.isciii.es/ bes/ bes.htm.
In Spain the investigation of outbreaks of any diseases in humans is regulated within the National Epidemiological Surveillance Network.
The responsibility and coordination falls on the epidemiologist charged with the investigation of each outbreak. In foodborne outbreaks this is also the case, but in close coordination with those who have to investigat

Description of the types of outbreaks covered by the reporting:

The Spanish System covers all type of outbreaks, family, general and international outbreak

National evaluation of the reported outbreaks in the country:

Relevance of the different causative agents, food categories and the agent/ food category combinations

Salmonella is the agent more frequently implied in foodborne outbreak, emphasizing S. Enteritidis.
The food implied in its majority was eggs and eggs products
Eggs
Meat
Milk

Relevance of the different type of places of food production and preparation in outbreaks

The place of consumption of the implied food was, mainly, the familiar home, being the time of the year with more foodborne outbreaks the summer and contributor factor more frequent the inadequate temperature.

Control measures or other actions taken to improve the situation

Outbreak investigations as well as necessary control measures are carried out by the health authorities of the autonomous regions.

Foodborne Outbreaks: summarized data

	Total number of outbreaks	Number of possible outbreaks	Number of verified outbreaks
Bacillus	5	0	5
Campylobacter	4	0	4
Clostridium	9	0	9
Escherichia coli, pathogenic	5	0	5
Foodborne viruses	13	0	13
Listeria	0	0	0
Other agents	31	0	31
Parasites	5	0	5
Salmonella	187	0	187
Staphylococcus	17	0	17
Unknown	218	0	218
Yersinia	1	0	1

Verified Foodborne Outbreaks: detailed data

B. cereus

	Value
Code	
Subagent Choice	Bacillus; B. cereus
Outbreak type	Household
Human cases	11
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	pasta pulse, oil-seads
Type of evidence	Laboratory detection in implicated food
Setting	Household
Place of origin of problem	Household, domestic kitchen
Origin of foodstuff	Not relevant
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	2
Comment	

B. cereus

	Value
Code	
Subagent Choice	Bacillus; B. cereus
Outbreak type	General
Human cases	42
Hospitalized	0
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	fish cereals
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Inadequate heat treatment, Cross-contamination
Outbreaks	3
Comment	

C. jejuni

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

C. jejuni

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	43
Hospitalized	1
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	broiler meat (1) unknown (1)
Type of evidence	
Setting	School, kindergarten
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Storage time/temperature abuse
Outbreaks	2
Comment	Setting: school, geriatrics

Campylobacter spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	10
Hospitalized	0
Deaths	0
Foodstuff implicated	Drinks, including bottled water
More Foodstuff	water (1)
Type of evidence	
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure
Outbreaks	1
Comment	contributory factors flooding, heavy rain

C. perfringens

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	573
Hospitalized	1
Deaths	0
Foodstuff implicated	Bovine meat and products thereof
More Foodstuff	cheese (1) bovine meat (2) pig meat (1) broiler meat (1) other food (2) unknown (2)
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Unknown, Storage time/temperature abuse, Infected food handler, Inadequate heat treatment, Cross-contamination
Outbreaks	9
Comment	setting: restaurant hotel (4) school (2) Hospital (1) Prison(1) unknown (1)

E.coli, pathogenic, unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	86
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	meat other animal (1) soups, gravies (1) fish (1) other salads (2)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse, Infected food handler, Inadequate heat treatment, Cross-contamination
Outbreaks	4
Comment	setting: restaurant hotel (1) canteen (1) school (2)

Enteropathogenic E. coli (EPEC)

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	6
Hospitalized	0
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	
Type of evidence	
Setting	Hospital or medical care facility
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Infected food handler
Outbreaks	1
Comment	

Calicivirus (including norovirus)

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	424
Hospitalized	23
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	crustaceos (1) unknown (4) other salads (3) water (1) other food (1)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Cross-contamination, Water treatment failure, Unprocessed contaminated ingredient, Storage time/temperature abuse, Infected food handler, Inadequate heat treatment
Outbreaks	10
Comment	setting: Hotel restaurant (5) Other (1) canteen (1) geriatrics (1) unknow (2)

Hepatitis A virus

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Hepatitis A virus

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Rotavirus

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	10
Hospitalized	0
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure
Outbreaks	1
Comment	flooding, heavy rain

Histamine

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	9
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment
Outbreaks	2
Comment	

Histamine

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	131
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	fish (8) crustaceans (1) unknown (1)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler, Unprocessed contaminated ingredient, Unknown, Storage time/temperature abuse
Outbreaks	10
Comment	setting restaurant (4) retail store (4) school (1) unknown (1)

Mushroom toxins

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	mushroom
Type of evidence	
Setting	Camp, picnic
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	
Outbreaks	1
Comment	

Mushroom toxins

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	19
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	mushroom
Type of evidence	
Setting	School, kindergarten
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Mycotoxins

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Cereal products including rice and seeds/pulses (nuts, almonds)
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	33
Hospitalized	0
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	other salads (1) unknown (1)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler, Inadequate heat treatment, Storage time/temperature abuse, Cross-contamination
Outbreaks	2
Comment	setting: Hotel (1) other institution (1)

Other

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse, Inadequate heat treatment
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	25
Hospitalized	0
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	5
Hospitalized	0
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	95
Hospitalized	0
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	unknown (1) water (1)
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure
Outbreaks	2
Comment	unknown (1) school (1)

Other

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	44
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Other

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	19
Hospitalized	4
Deaths	0
Foodstuff implicated	Herbs and spices
More Foodstuff	Herbs spices (1) water (1)
Type of evidence	
Setting	Camp, picnic
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	2
Comment	

S. flexneri

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	3
Hospitalized	2
Deaths	0
Foodstuff implicated	Unknown
More Foodstuff	
Type of evidence	
Setting	School, kindergarten
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. flexneri

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Fish and fish products
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. sonnei

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	6
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	other salads
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown
Outbreaks	1
Comment	

S. sonnei

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	8
Hospitalized	3
Deaths	0
Foodstuff implicated	Tap water, including well water
More Foodstuff	
Type of evidence	
Setting	Camp, picnic
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure
Outbreaks	1
Comment	

V. parahaemolyticus

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	26
Hospitalized	1
Deaths	0
Foodstuff implicated	Crustaceans, shellfish, molluscs and products thereof
More Foodstuff	
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse
Outbreaks	1
Comment	

Trichinella

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	83
Hospitalized	17
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	pig meat and products (2) wild boar meat (2)
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Inadequate heat treatment
Outbreaks	4
Comment	

Trichinella

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	8
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	wild boar meat
Type of evidence	
Setting	Other setting
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Unprocessed contaminated ingredient
Outbreaks	1
Comment	

Other serotypes

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	2
Hospitalized	0
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient
Outbreaks	1
Comment	

S. Enteritidis

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	206
Hospitalized	57
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and egg products (31) fancy cake (3) water (2) unknown (3)
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Unprocessed contaminated ingredient, Storage time/temperature abuse, Inadequate heat treatment, Infected food handler
Outbreaks	39
Comment	

S. Enteritidis

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	725
Hospitalized	78
Deaths	1
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and egg products (32) varied food (4) fancy cakes (4) broiler meat (2) cheese (1) other salsa (1) unknown (12)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Cross-contamination, Inadequate chilling, Inadequate heat treatment, Storage time/temperature abuse, Unknown
Outbreaks	56
Comment	setting: restaurant (25) farm (1) canteen (1) school/kindergarden (3) prison (1) Other (5) unknown (12)

S. Hadar

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	10
Hospitalized	8
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	varied food
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Inadequate heat treatment, Storage time/temperature abuse
Outbreaks	1
Comment	

S. Typhimurium

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	15
Hospitalized	4
Deaths	0
Foodstuff implicated	Bakery products
More Foodstuff	baker products (1) sausages (1)
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unknown, Infected food handler
Outbreaks	2
Comment	

S. Typhimurium

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	104
Hospitalized	3
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and egg products (1) milk(1) broieler meat (1) varied food (1) unknow (2)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Cross-contamination, Inadequate chilling, Inadequate heat treatment, Storage time/temperature abuse, Unknown, Unprocessed contaminated ingredient
Outbreaks	6
Comment	setting: restaurant (1) school (1) catering (1) unknown (3)

Salmonella spp.

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	424
Hospitalized	19
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and eggs products (11) Fancy cake (3) chesse (1) Broiler Meat (1) saussages(1) soups, gravies (1) cereals (1) others foods (2) unknown (11)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Unknown, Storage time/temperature abuse, Inadequate heat treatment
Outbreaks	33
Comment	setting: restaurant (20) Canteen (7) geriatrics (1) other (4) unknown (1)

Salmonella spp.

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	249
Hospitalized	73
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	eggs and eggs products(36) fancy cakes (2) meat (1) broiler meat (2) water (1) varied food (3) unknown (4)
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Unknown, Storage time/temperature abuse, Inadequate heat treatment, Cross-contamination
Outbreaks	49
Comment	

S. aureus

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Other foods
More Foodstuff	fancy cakes
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Infected food handler, Inadequate heat treatment
Outbreaks	1
Comment	

S. aureus

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	121
Hospitalized	1
Deaths	0
Foodstuff implicated	Broiler meat (Gallus gallus) and products thereof
More Foodstuff	broiler meat (1) sausages (1) crustacean, molusc (1) soups, gravies (2) cereals (1) fish salads (2) potato salad (1) other salads (1) varied food (1) unknown (2)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Storage time/temperature abuse, Cross-contamination, Infected food handler, Inadequate heat treatment
Outbreaks	13
Comment	setting hotel (5) canteen (3) ambulant service (1) school (1) other (2) geriatric (1)

Staphylococcus spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	General
Human cases	23
Hospitalized	0
Deaths	0
Foodstuff implicated	Cereal products including rice and seeds/pulses (nuts, almonds)
More Foodstuff	cereal (1) other food (1)
Type of evidence	
Setting	Restaurant, Cafe, Pub, Bar, Hotel
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse
Outbreaks	2
Comment	canteen (1), school(1)

Staphylococcus spp., unspecified

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	0
Deaths	0
Foodstuff implicated	Cheese
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Unprocessed contaminated ingredient, Storage time/temperature abuse
Outbreaks	1
Comment	

Unknown

	Value
Code	
Outbreak type	General
Human cases	2906
Hospitalized	54
Deaths	2
Foodstuff implicated	Eggs and egg products
More Foodstuff	unknown (79) milk (1) eggs (16) meat (4) bovine meat (2) pork meat (1) mixed meat (1) brolier meat (5) fish (10) crustacean (16) soups, gravise (3) fancy cakes (4) fish salads (1) other salads (2) potatoes (1) ice cream (3) chocolat (2) fast food (1) water (10)
Type of evidence	
Setting	Unknown
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Water treatment failure, Unprocessed contaminated ingredient, Storage time/temperature abuse, Infected food handler, Cross-contamination, Inadequate heat treatment, Inadequate chilling
Outbreaks	181

	Value
Comment	setting: unknown (20) Restaurant, hotel (75) bar (35) Other setting (23) school (7) hospital (1) canteen (3) geriatrics (11) prison (2) Camp (2) picnic (2)

Unknown

	Value
Code	
Outbreak type	Household
Human cases	165
Hospitalized	12
Deaths	0
Foodstuff implicated	Eggs and egg products
More Foodstuff	Cheese (1) eggs (7) pork meat (1) Broiler meat(2) sausage (1) fish (4) crustacean, mollusco (2) Fancy cakes (4) other salads (1) water (2) varied food (2) unknown (10)
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse, Unprocessed contaminated ingredient, Infected food handler, Cross-contamination, Inadequate heat treatment, Inadequate chilling
Outbreaks	37
Comment	

Y. enterocolitica

	Value
Code	
Subagent Choice	
Outbreak type	Household
Human cases	4
Hospitalized	1
Deaths	0
Foodstuff implicated	Pig meat and products thereof
More Foodstuff	
Type of evidence	
Setting	Household
Place of origin of problem	Unknown
Origin of foodstuff	Unknown
Contributory factors	Storage time/temperature abuse, Inadequate heat treatment
Outbreaks	1
Comment	